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MEDICINE AND THE MEDICAL AGE

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Practical Therapeutics

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ORIGINAL COMMUNICATIONS.

THE EARLY RECOGNITION AND TREATMENT OF CANCER—THE DUTY AND THE OPPORTUNITY OF THE GENERAL PRACTITIONER.[1]

BY HOWARD A. KELLY, M.D.,

Professor of Gynecology in the Johns Hopkins University, Baltimore.

I well remember the summer of 1886 when I was in Brighton, England, attending the British Medical Association, taking part in the discussions in the Gynecological Section, on extra-uterine pregnancy, and meeting Lawson Tait and other distinguished men who were present in large force. Our own John Shaw Billings had gone over to deliver the chief address in medicine, which he did with great success before the vast assemblage of all the combined sections, illustrating his subject with telling maps of our own country variously colored to show the localization and spread of certain diseases, including cancer; the title of the address being "Medicine in the United States and its Relations to Coöperative Investigation."

From the time of that address, much criticized in this country, within the scope of my personal observation, the cancer question seems to have been held more or less constantly and acutely in the public eye. Its terrible ravages, its wide and growing domain, and the successively lower ages which it attacks, are now well known and have aroused not only the medical profession but our lay population as well, until to-day our whole country may be said to be engaged in a cancer hunt, and a good measure of the desired coöperation necessary in handling so vast a subject is secured.

Since the eighties large sums have been appropriated by State and private munificence to foster a perpetual investigation of this difficult and perplexing problem, and we have a New York State Hospital for the Study of Malignant Diseases at Buffalo, the great Crocker Fund laboratories in New York City, as well as the General Memorial Hospital and the Rockefeller Institute in New York, the latter devoting its energies to the problem from time to time. At Harvard the Huntington Cancer Research Fund is doing a great work, and at St. Louis the Skin and Cancer Hospital is also prosecuting its investigations in able hands. There are doubtless others which I do not recall at the moment. In addition to these groups of team workers there is an army of individual workers, who, while not obligated to do continuous work, yet lend yeoman efforts to the solution of this most vexed of all our medical problems.

In spite however of this army of devoted enthusiasts, cancer is still with us and bids fair to remain a burning question still for several decades. Let me hasten to add, however, that no one doubts its ultimate solution.

Cancer derives its towering importance

[1]The illustrations distributed through the text relate to the cases referred to at the end of the article and are intended to emphasize the importance of early treatment as well as to exhibit the effects of the use of a sufficient quantity of radium in preference to surgical procedures in such cases.

to-day not alone from the fact that it is so distressing and so destructive to life, and from its wide-spread distribution, but also from the additional fact that the situation even under existing conditions is capable of considerable amelioration. It is for this last

FIG. 1.—Cancer near the inner angle of the right eye, before radium treatment, Oct. 13, 1916.

reason that I write this letter of appeal to the profession through the broad medium of the THERAPEUTIC GAZETTE.

What is the cause of cancer? The answer is brief, in three words: "No one knows." As far as we can surmise, the cause seems to lie in one or other of two alternatives: either it springs like so many other, and some apparently kindred, diseases from a germ invasion, attacking the cells of a part and exciting them into an abnormal activity and to the invasion of other organs; or, on the other hand, it is more simply to be explained as a deranged cell activity, arising from some trophic disturbance or chemical irritant, which so alters the vital processes as to set the cells free from their customary established control in their normal habitat, releasing them in the midst of the tissues of the body as in a culture tube, to wander riotously until the regular life of each part is attacked, dominated, and destroyed. Dr. Willy Meyer, one of our most capable observers, holds to the former interpretation, while I think most students have swung over to the latter view, not so much from any clear accumulated convincing evidence as from a gradually formed impression which has grown with an increasing familiarity with the subject.

Fortunately this failure to find the cause, and to decide positively between two such conflicting views, at the very threshold of the great problem, does not leave us helpless in dealing with the matter in a practical way, for the intensive study of the past two

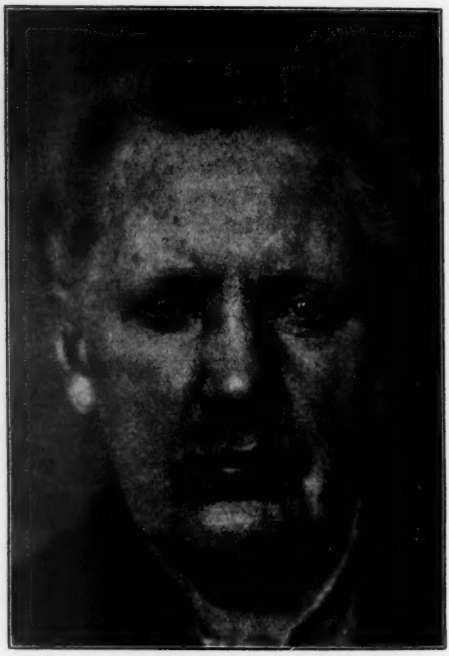

FIG. 2.—The same case as Fig. 1 of cancer near the inner angle of the right eye after treatment, Jan. 5, 1917.

decades has brought to light many interesting and helpful facts which rightly applied will save an army of lives year by year. It has happened here, as so often in other fields, that our practical genius has run ahead of our theoretical knowledge.

The matter now before us for consideration is a little better understanding of the subject in its present-day practical rela-

tions. Let me present my conclusions in the form of several important categorical statements:

1. Cancer is in the beginning a purely local disease, which starts to grow in one spot and in a small area, from which it spreads so as to involve adjacent areas, and finally to invade the blood and lymphatic channels, through which it becomes disseminated in other parts of the body.

2. Cancer is never "a blood disease" at the outset, as many even yet imagine. The only support of this theory rests in the fact that later in its course cancer does invade

FIG. 3.—Epithelioma of the nose before radium treatment. April 12, 1917.

the blood and the lymphatic channels, through which it is widely distributed. Another prop to the "cancer-in-the-blood" theory is the quack ever eager to sell his "blood-purifying medicines" to poor confiding dupes and victims.

3. A cancerous lesion may remain for years quiescent and apparently benign.

4. A corollary to this last statement is this, that seemingly innocent growths, ulcers and patches of chronic inflammation, often in time, after five, ten, or twenty years, may become actively malignant.

5. An actively malignant growth may go through what is called a precancerous stage, during which it is benign as far as the danger of a recurrence following operation

FIG. 4.—Cancer of the nose after radium treatment, Oct. 12, 1918. Same case as Fig. 3.

is concerned, yet under the microscope it presents some of the characteristics of cancer.

6. It follows therefore that there are several progressive stages from benign to greater malignancy in the development of many cases of cancer.

7. We have learned in recent years these important practical facts:

(*a*) A continuous irritation kept up at one point often ends by starting a cancer there; burning, scratching, rubbing, or constant blows will effect this transformation.

(*b*) A bruise is particularly dangerous in such an organ as the breast.

(*c*) An old unhealed burn of the skin and an ulcer of the stomach easily become cancerous.

(*d*) The chemical irritation of a dye will

produce cancer, as in the instance of the cancers of the bladder in workers in aniline dyes.

(*e*) The lesions of syphilis and cancer are often indistinguishable, and a chronic syphilitic lesion, especially when situated on the mucous membrane, often passes over into cancer.

(*f*) I have seen cancer of the penis caused by the irritation of gonorrheal secretions.

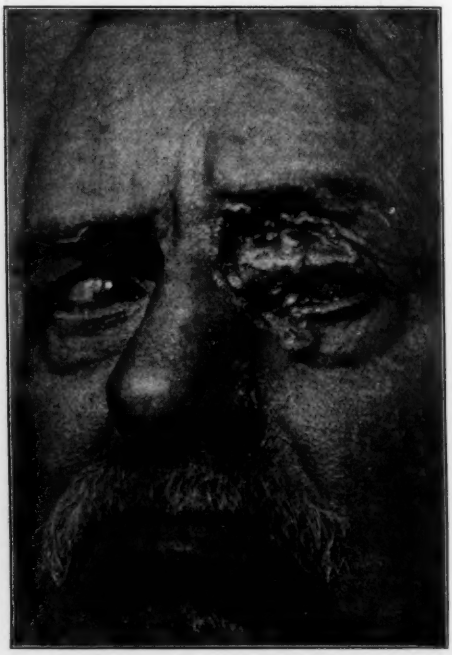

FIG. 5. — Extensive epithelioma of the left eyelids in the nasal-orbital angle before treatment, Oct. 4, 1917.

(*g*) The irritation due to cigar and pipe smoking or chewing is a prolific cause of cancer of the lip and mouth. Add to the use of tobacco, the common bad teeth, foul mouth, and syphilis, and we seem, judging by experience, to have an ideal combination for mouth cancer.

(*h*) Pigmented moles ought to be watched with great care and ought not to be meddled with by a tyro; judging by the numbers of cases of melanosarcoma I see there must be a great many deaths from this terrible disease year by year.

8. If the cancer can be discovered in its early incipient stage it can be cured either by surgery or radium.

9. Even after the disease has apparently been cured, the patient needs to be watched for years afterward in order to discover any recurrence in its early stage.

10. The transmission and cure of cancer in fish, fowls, and animals, while affording most interesting study for the laboratory, has not yet proved of any great service to man in elucidating the question of causation or methods of cure.

We might briefly summarize the result of these past years of multiplied activities in this domain by saying they have brought the subject prominently before the consciousness of the public, and so have secured a more or less nation-wide coöperation in the discovery and treatment of many cancer cases in an early stage. Does some one remark, "That is not much?" Well, as a matter of fact, it actually saves thousands of lives yearly, and when later on the entire medical profession at last acts as one man in lending hearty aid in seeking out and se-

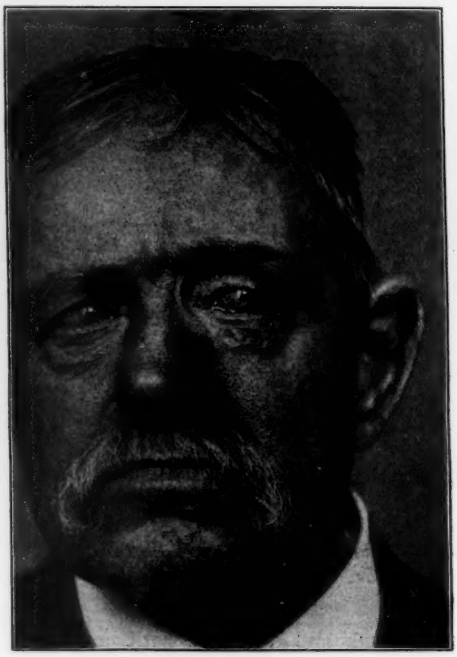

FIG. 6.—The same patient as Fig. 5 after radium treatment, April 20, 1918.

curing prompt treatment for all the early cases, many thousands more will be saved.

It is well to pause here to thank the public press for the splendid aid given in circulating this information; notably one might mention *The Ladies' Home Journal.*

I speak feelingly of the results of the recent propaganda, for I am continually seeing patients who come of their own initiative to ask whether this or that small growth is cancerous. I also see those who have been told by their physicians that "it is nothing," when as a matter of fact they ought to have an immediate operation. It is a curious reflection on our feeble human mentality that so many late comers declare that they have hesitated to go to a doctor

Fig. 7. — Extensive epithelioma of the nose and inner canthus of the eye treated with radium, June 15, 1918.

"for fear he might tell them it was serious!" Again, others have been counseled to "wait and see if the tumor grows," and this too by a doctor! A doctor may readily be forgiven for not knowing whether or no a given case needs an operation, but hardly for taking a chance with a life, when more skilled advice is available. To decide the question by seeing "whether it grows or not" takes time, and time is the one thing we cannot spare in this important decision. The doctor waits and the patient waits, but the cancer or the sarcoma refuses to wait, even one day, but keeps on spreading in the tissues.

Let me try to summarize the experience

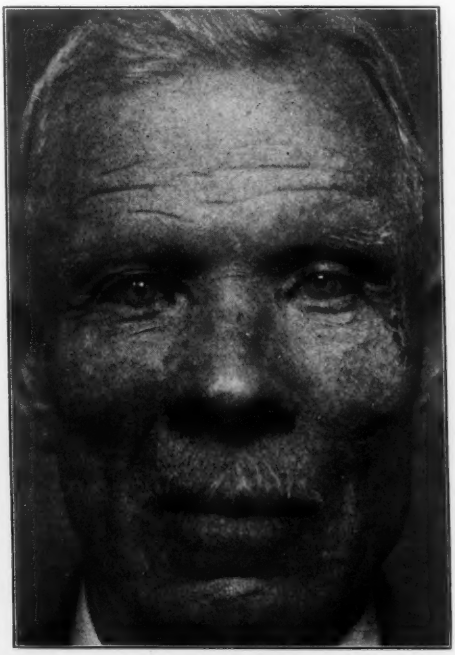

FIG. 8. — The result of the radium treatment Sept. 28, 1918. Compare such a result with the surgeon's knife, which would have obliterated a large part of the left face, including the eye.

of some forty years in the field of surgery, and give some well-meant and I trust good advice.

It is a safe rule to always assume malignancy until the contrary is proved. I am sorry to say, and here I willingly risk repetition for emphasis, that just the opposite seems to be the rule of thumb, namely, to assume innocence until the untoward course of events forces an opposite conclusion. This is natural, as the doctor hates to alarm his friend and patient, and where he does not know he naturally tries to fall in with his or her own views and wishes.

Out of every ten such guesses about four will come back later to make him wish with

all his heart that he had taken alarm and had acted earlier. Forty per cent is a pretty big sacrifice when it involves great suffering for years and the loss of life. If we were dealing with a piece of property we would surely never rest from the moment we thought it was jeopardized until all doubt as to its safety was removed.

Any little lump appearing on the body, a tiny sore on the face, a hard spot in the breast, an irritated mole, a swelling of any kind, must be taken seriously. If the physician himself cannot decide with certainty what is the best course, then let him ask for more expert advice.

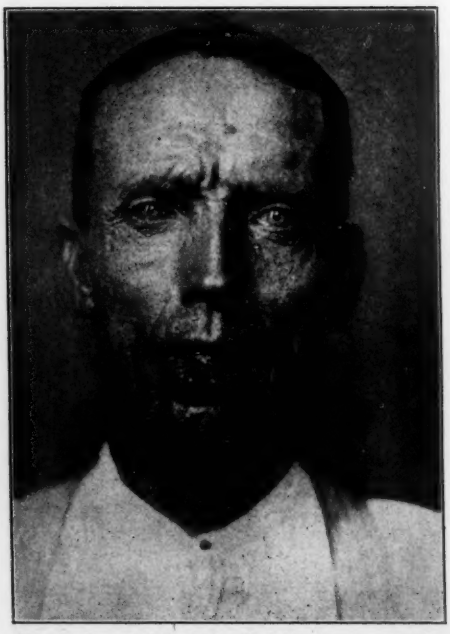

FIG. 9.—Cancer of the lower lip before treatment with radium, Aug. 3, 1917.

Let me review this important matter in a regional way, calling attention to some of the commoner as well as to several of the more important affections, assured that if the physician's sense of responsibility is aroused with regard to these he will not be long in acquiring information about sundry other affections not mentioned.

Whether the physician practices surgery himself or whether he refers his surgical work to some qualified friend, I know of no work he can do for suffering humanity likely to give him a keener sense of satisfaction than to safeguard his patient against the terrible ravages of cancer by timely action. I shall exclude from our consideration any mention of cancer of the womb, reserving it for separate treatment at greater length than would be appropriate in this summary of the larger field.

Let us begin with the most obvious of all cancers, as well as the commonest, those which begin in the skin of the face, called basal-celled epitheliomata. These start in one of the little horny, scurfy patches on the face or hands, or in a little greasy spot, looking like an inflamed patch of sebaceous glands, slightly elevated, pale, somewhat clear-looking, inclined to itch, and tending as it advances to break down in the center, to bleed a little, and to form a scab. From this small beginning it spreads with infiltrated, harder, slightly elevated margins, as it grows progressively larger, until in time it covers the entire face and invades at last the deeper tissues, causing in its march the

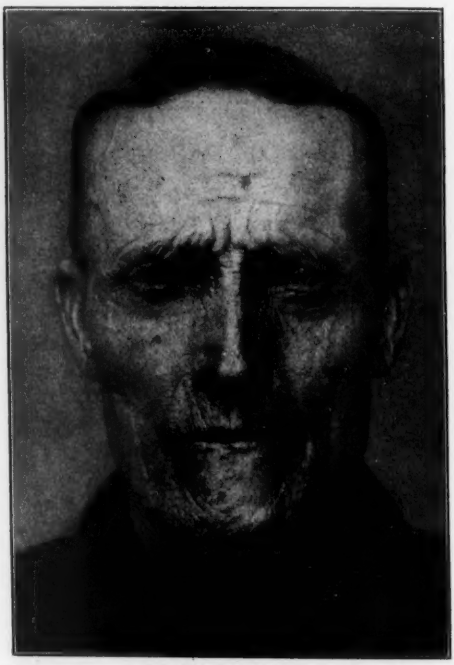

FIG. 10.—The same patient as Fig. 9, Jan. 13, 1919. Compare this result with the mutilation of a surgical operation.

destruction of the ear, the eye, and the nose, all the time exhaling a frightful fetid odor. In the more advanced stages nothing can be done but to relieve the poor victim with opiates and give the care which requires pretty much all the time of one individual. Death is the victim's best friend.

Taken early the treatment of these face cancers is most successful, and consists in either radium or surgery. I mention radium first because it is far preferable to surgery, as radium in the early cases resolves the tissues back to normal without loss of substance or disfigurement. Radium is also better because of the frequency with which the lesion is located near the ear or the nose

FIG. 11.—Hodgkin's disease in glands of left neck before treatment, May 8, 1917.

or the eye. In such a case the surgeon, in order to save appearances or to avoid a badly everted eyelid, leaves more tissue than he ought to, and so has the humiliation of witnessing a recurrence calling for a still more difficult extirpation. I show here several of these patients given radium treatment (Figs. 1, 2, 3, 4, 5, 6, 7, 8).

In cancer of the lip it is also of the utmost importance to suspect at once the tiniest lesion which does not heal immediately, or which breaks out a couple of times, or which keeps fissured. If the man is a smoker he must give up his habit at once and for all. Here, too, radiation or an early operation will save a world of sorrows and after regrets (see Figs. 9 and 10). The great urgency for immediate action in this

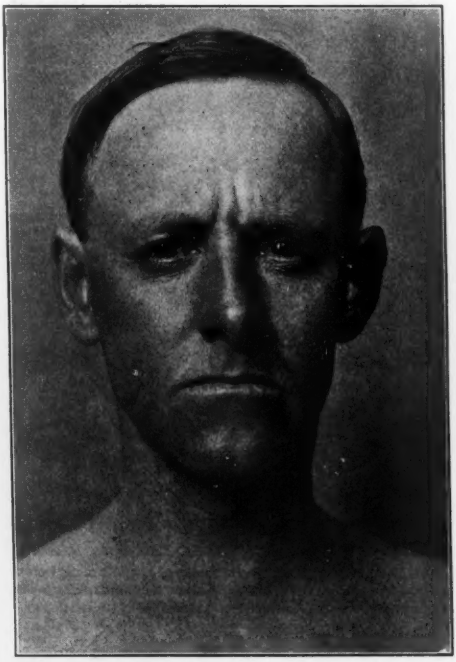

FIG. 12.—Hodgkin's disease after treatment with radium, Sept. 18, 1917. These cases require close watching at intervals of a few weeks, over a period of several years. This patient has recently returned for treatment of an axillary involvement. Others remain apparently permanently well.

group lies in the fact that as soon as the lesion assumes any size, and sometimes when it is insignificant, it jumps down into the glands of the neck, where only a radical mutilating operation can reach it. Radium will cure the lip lesion often, but surgery must be the rule for the gland area for the present.

Mouth and tongue cancer must also be discovered early for any successful treatment, for once the deeper tissues are involved the case is almost hopeless from every standpoint. Some tonsillar growths are very responsive to radium and some not

at all, and all if malignant are awfully poor surgical risks.

The larynx, on the other hand, is a brilliant field for radium, and many a larynx, and many a life, has been saved by its timely use. Of the very advanced cases, with wide-spread infiltrations, the best that can

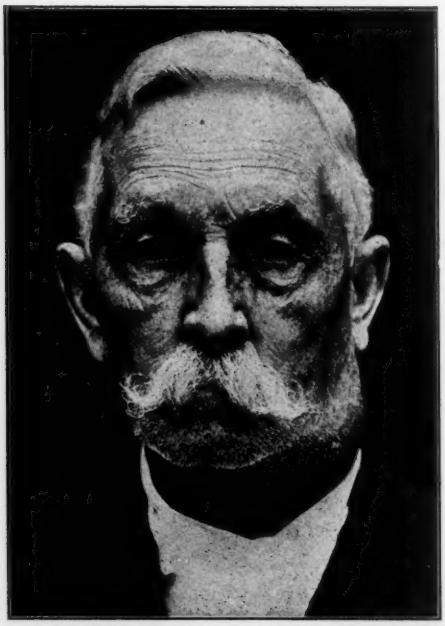

FIG. 13.—Extensive lymphosarcoma of the left neck before radium treatment, Oct. 11, 1913. I show this because he is one of our earliest cases and is a good example of permanency.

be said is that they can sometimes be helped considerably.

I would like to write a volume about the urgency of treating seriously every little lump in the breast, if in that way I could but impress and persuade my confrères to be alarmed earlier and to seek advice if uncertain. Here surgery is the recourse, or rather surgery plus the microscope. Let me, metaphorically speaking, go down on my knees to my brethren of the profession, as I beg them not to throw away the suspected tissue removed, but to put it at once into a 10-per-cent solution of formalin and send it to a first-class pathologist for a report. The wide-mouth bottle with its 10-per-cent formalin solution is just as essential a tool in the surgeon's kit as his knife, or his needles and suture materials.

I cannot refrain at this point also from an appeal for a fuller recognition of the indispensable services of our tissue pathologists. The surgical arm is sadly crippled, and the public suffers in the loss of many valuable lives, where the services of a competent pathologist are not easily available. Let us insist that every medical center, even the lesser ones, shall support a pathologist with a substantial salary with a first-class laboratory. The present scarcity of men in this splendid branch of the medical service is due to the lack of recognition and the miserly salaries paid.

Now in the matter of cancer of the breast there is a surgical paradox to be proclaimed, namely, that while it is not in the best interests of the patient to treat any small growth or good operable risk with radium,

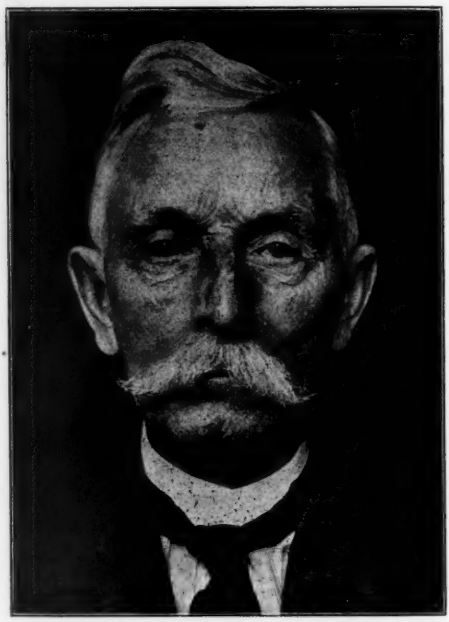

FIG. 14.—Same man as in Fig. 13 in January, 1914, after all evidence of disease had disappeared. This patient remains perfectly well (1919).

nevertheless radium will sometimes do wonders in a very advanced inoperable case, and radium is invaluable in recurrences, and in preventing recurrences.

The shotty skin implantations, which so often come back after you excise them, invariably melt away under radium. The

neck glandular growths over the clavicle are harder to handle. There is one important criterion in breast cancers which Dr. C. F. Burnam, my colleague, has insisted upon for some years now, and that is the taking of an *x*-ray of the chest before operation and before radium treatments. If metastases are found in the lungs it is useless to radiate, or indeed to do anything else with the expectation of a cure.

Let me in passing call attention to the fact that Hodgkin's disease (see Figs. 11 and 12) is amenable to radium to an extraordinary degree, and here too the earlier the trouble is taken in hand the better is the permanent result. Such patients need close watching over a considerable period to prevent an outbreak in other glands.

Lymphosarcoma, from a surgical standpoint an utterly incurable disease, is easily dissipated with radium if taken early, and responds remarkably even in its more advanced stages. I show a case in point (Figs. 13 and 14).

Let me conclude with sarcoma of the testis, so fatal through early metastases up into the abdomen: here we often get brilliant results from radium, and improvement even when it is far advanced.

Cancer of the rectum is one of our greatest reproaches; so many come to the surgeon after months or years of treatment for hemorrhoids! The rule should be that every hemorrhoid case should be suspected to be a case of cancer higher up until a satisfactory proctoscopic examination has proved the contrary. In other words, hemorrhoidal operations are by many undertaken too jauntily, entirely too light-heartedly, without sufficient investigation.

The sum of the whole matter seems to be this—that greater zeal is needed on all sides in getting hold of our cancer cases earlier, and an equally greater zeal is imperative in getting them operated upon, or treated with radium, at an early date. The goal ought to be, "a diagnosis, and an operation if necessary, within a week after the discovery of the lesion!"

And again, and yet again, let me reiterate it: save your tissues and have them examined. It is a serious reproach to any surgeon or hospital when tissues are thrown away with only a naked-eye examination and diagnosis. And not only should the tissues be examined, but a slide and a bit of the tissue should be preserved in the laboratory for future reference.

With this appeal I conclude this brief paper on a great subject.

THERAPEUTIC ABORTION.[1]

BY EDWARD P. DAVIS, A.M., M.D., F.A.C.S.,
Professor in Obstetrics, Jefferson Medical College of Philadelphia.

The interruption of pregnancy without just cause may be an error, or, under some circumstances, a crime; but there are cases in which this becomes a duty of the obstetrician.

In therapeutic abortion, consideration for the life of the embryo does not enter; the interests of the mother alone are paramount. To justify the production of abortion, some condition must be present which renders the continuation of pregnancy morally certain to jeopardize or, perhaps, to end her life.

The conditions which most often clearly demand therapeutic abortion are toxemia of early pregnancy, pernicious nausea or vomiting, and inability to maintain the nourishing metabolism of the body. In these cases difficulty in diagnosis may readily arise.

Women who earnestly desire interruption of pregnancy may willingly produce the symptoms of pernicious nausea and vomiting, and, unless carefully watched and strictly observed, may lead a physician to make the mistake of diagnosing an impending danger and decide to interrupt pregnancy.

Hysterical women may become imbued with the belief that they are seriously ill

[1]Read before the Northern Medical Association, Philadelphia.

and, producing the symptoms of pernicious nausea and vomiting, may cause an error in the diagnosis without wilfully intending to deceive. In no condition in obstetric practice is accurate observation of the patient so absolutely necessary. She must be under the care of an intelligent, keen-witted caretaker, who will faithfully record every ounce of nourishment taken, the output of the patient, her general condition and all her symptoms. A summary of the nourishment retained in each twenty-four hours and the output of the patient should always be available for the physician's observation. In cases of intentional deceit, the caretaker must be on her guard lest the patient escape her vigilance and procure nourishment in some manner, while pretending to take absolutely nothing. In the hysterical patient the observation of the caretaker is of the greatest importance in confirming the disappearance of symptoms when the patient is without an audience, or in noting those occasions when the patient forgets to be sick.

A positive diagnosis of the toxemia of early pregnancy may be made possible by accurate laboratory research; none of these cases escape profound disturbances in the nitrogen metabolism, and if the twenty-four hours urine be subjected to a thorough examination, including the nitrogen partition, the result will give information of great value. Again, the examination of the blood is also of paramount importance; if the patient is advancing steadily in progressive toxemia, the red blood-corpuscles will give evidence of the disintegration of the blood, the percentage of hemoglobin will be altered, and the blood picture will be such as to leave no doubt of the gravity of the condition.

The physical examination of the patient may reveal blood-pressure and pulse tension increased or markedly lessened, and affords ample evidence of a serious derangement in the secretory functions.

In cases in which the patient at first seems to respond to treatment and improves possibly for a short time, it is of the greatest importance that the cessation in her improvement and possibly her failure to continue to gain should be promptly recognized. This cannot be done by ordinary observation only, but the daily report of the nurse must be supplemented by examinations of blood and urine and a thorough physical examination of the patient.

A hasty decision to perform therapeutic abortion in toxemia of early gestation must be avoided; sufficient time must be taken to make the necessary examinations and give a clear and prompt decision concerning the patient's danger. It must be shown that the patient is genuinely toxic, that she is steadily growing worse and treatment has failed to improve her condition. When such is the case, the sooner pregnancy is terminated the better.

An obstetric operation is the only safe means of terminating an early pregnancy. Anesthesia by nitrous oxide and oxygen is especially valuable in these cases. Under careful antiseptic precautions, the patient having been catheterized, a bimanual examination is made to confirm the diagnosis of pregnancy and to ascertain whether any abnormal condition exists in the pelvis. If no contraindication is found, the operator should then dilate the uterus with solid dilators until he can introduce a broad, blunt-ended, sharp-edged curette; one which has no hollow stem and does not permit the use of fluid within the uterus is safest. With this the interior of the womb should be thoroughly curetted and portions of the material removed saved for microscopic examination. When this has been done the uterus may be irrigated with douche curette with 1-per-cent lysol and thoroughly tamponed with 10-per-cent iodoform gauze. The vagina should be moderately tamponed with iodoform or sterile gauze, care being taken that the uterus be left anteverted and at, or above, the pelvic brim. This packing should be removed in thirty-six to forty-eight hours, and a copious vaginal douche given. During convalescence, if necessary, the patient should assume the knee-chest

posture, so that the uterus may assume, or retain, its normal position. It is impossible to remove by the curette all of the impregnated ovum and its membranes; the greater portion of the débris will come away when the gauze packing is removed. The remainder is readily discharged in the lochia. During the patient's convalescence, tonic doses of strychnia and ergot should be given to insure a proper involution of the uterus.

In very serious cases of toxemia of early pregnancy the blood may be so disintegrated that fatal hemorrhage may develop. Under these conditions treatment is unavailing; yet an effort must be made to check bleeding and reënforce the patient's blood serum by injections of sterile horse serum, which has proved useful in many cases.

Another undoubted indication for therapeutic abortion is pregnancy complicated by a serious heart lesion. In all cases in which compensation is rapidly failing, the pregnancy must not be allowed to continue. Accurate observations for a sufficiently long time to thoroughly study the case must be carried out before the decision is made to operate.

A condition in which there exists some difference of opinion concerning the production of therapeutic abortion is pregnancy complicated by tubercular infection. A distinction must be made between cases in which the patient was not infected with the tubercle bacillus before she became pregnant and cases in which the patient was tubercular before conception occurred. In the former the prognosis is better, for the pregnant woman of ordinarily good development and physique, becoming tubercular, may hope to recover under proper treatment almost as readily as a woman who is not pregnant. Such patients, however, require close observation so that, should improvement cease, warning may promptly be given, and the pregnancy immediately interrupted. Patients, however, who are tubercular when conception occurs should invariably be treated, in the opinion of the writer, by prompt termination of pregnancy. In such cases the question arises, Should not the patient be so treated as to make further impregnation impossible? Many methods have been proposed for attaining this object, but unquestionably the safest and most reliable is abdominal section, followed by removal of the Fallopian tubes and the upper two-thirds of the uterus. If healthy, the ovaries should be retained. In the writer's experience this operation has been, in its results, most satisfactory. In patients who have not reached the menopause, menstruation has continued from that portion of the uterus still remaining as regularly and successfully as before the operation. In patients at or near the menopause, it is better not to attempt to retain the ovaries, but to include them in the tissues removed.

Reasoning largely by analogy from what has been done in some countries with animals, some obstetricians maintain that pregnancy should rarely be interrupted because of tubercular infection. Every effort should be made to stay the progress of the disease and bring about the patient's cure, and it is held that this result will not be hastened by the interruption of pregnancy.

It is the belief of the writer that all tuberculous women becoming pregnant should have the pregnancy interrupted so soon as possible; that pregnant women becoming tuberculous should be thoroughly examined, carefully and intelligently treated, and carefully watched. Should it become evident that the tubercular disease is gaining and that the patient is losing, then pregnancy should be immediately terminated.

In the presence of acute infectious diseases, other than tuberculosis, pregnancy, under no circumstances, should be interrupted. Abundant observation during the recent epidemic of pneumonia showed that those pregnant women who aborted had a death-rate of almost 100 per cent. The temptation to produce abortion in acute infectious diseases may be very great; the reasons for this are evident. Acute infections during pregnancy are dangerous in

proportion to the toxins which they produce and their effect especially upon the heart muscle of the patient; interruption of pregnancy is accompanied by an increase of toxemia in the mother. In patients having high temperature, hemorrhage during abortion often becomes exceedingly dangerous.

In dealing with this subject one must remember that, with some patients, religious belief and ecclesiastical authority may prevent the interruption of early pregnancy. In these cases the function of the physician is to state the truth, without reserve, leaving the responsibility for the final decision to the conscience of husband and wife; by their decision he must naturally abide.

In producing therapeutic abortion an effort should always be made by the method employed to cure if possible any local abnormality which may be present; thus, if the patient has retroflexion of the uterus and the uterus has not completely risen above the pelvic brim, the use of packing is especially essential in straightening the canal of the uterus; care should be taken that retroversion does not develop during convalescence. Where there has been chronic endometritis, the curetting may be followed by application of iodine before packing is introduced.

Obstetric surgery has removed from the category some indications for therapeutic abortion which were formerly valid; thus the presence of pelvic tumor complicating pregnancy is no longer an excuse for therapeutic abortion, but an indication for the removal of the tumor. Contracted pelvis has long since ceased to be an indication for therapeutic abortion. Cases of repeated overgrowth of the child with disastrous labor are successfully managed by restricted diet and induction of labor or by elective section, at term; under both methods the lives of mother and child are saved.

An interesting question is raised in a case in which the woman herself, mentally sound, was married to a man who developed degeneracy and mental unsoundness. During the first years of such a marriage the husband remained in good mental health, but degeneracy developed, and during its early stage the wife became impregnated. So evident was the condition that therapeutic abortion was induced to prevent the birth of a mentally unsound individual. It is evident that, in cases such as this, abuses might easily be practiced, and that a very careful study of all of the facts in the case must be made before the decision to interrupt pregnancy is formed. In the case to which reference has been made, an application for divorce succeeded with the court and the mother was given the custody of the children. Might it not, under the condition of confirmed alcoholism, be permissible to perform therapeutic abortion to prevent the birth of a stunted and invariably diseased offspring? In cases of syphilis, the treatment of specific disease is so successful during pregnancy that syphilis furnishes no valid excuse for the interruption of gestation.

The recent war has furnished shocking examples of women brutally impregnated by enemy soldiers. In the case of a French woman impregnated by a German soldier, and brought to trial for the murder of her infant, she was unanimously acquitted by a French court. Under such conditions, sympathy might suggest the scientific interruption of early pregnancy; but, as physical science is concerned with physical conditions only, there would be no sufficient ground for such a procedure.

INFLUENZA—A THERAPEUTIC LESSON.

BY SIMON BARUCH, M.D.,
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The modern history of medicine does not present a therapeutic problem more difficult than the management of this disease. Just when we were congratulating ourselves upon the success of immunization against typhoid fever and other diseases that had proved a scourge to mankind, the medical profession was confronted by the sudden appearance of an epidemic the prevention and spread of which has resisted the most scientific methods.

A careful survey of the reports from military and civilian sources shows that the symptomatology and pathology of this disease are clearly recognized, and the fact is obvious that despite these reliable clues to treatment, the latter have been unsatisfactory in the extreme.

To one who, like the author, has passed through some historic epochs in medicine, the painful fact obtrudes itself that we here have a repetition of the results of the once prevailing unsatisfactory symptomatic management of other infectious diseases, chiefly typhoid fever.

Time was when rapid pulse and elevated temperature were regarded as lethal factors which must be met by powerful medicinal agents, in order to carry the case to a successful issue. The rapid pulse was readily reduced by veratrum viride, but with occasional favorable results the average mortality continued.

When the coal-tar preparations offered a key to reduction of elevated temperature we regarded this discovery as an epoch in medicine, but it was a painful disillusion to learn later that these powerful remedial agents only enabled the patient to die with a lower temperature, while the mortality continued and even increased under their excessive routine use. When it was discovered that the coal-tar preparations handicapped the heart and in this way hastened the fatal issue, they were discarded most vigorously by the German clinicians who had most earnestly espoused them as life-saving.

The cold bath introduced in the German clinics for reducing temperature was equally unsuccessful until Ernest Brand pointed out that this procedure should be used for the purpose of maintaining the integrity of the central nervous system with a view to enhancing the functionating capacity of the heart and other organs upon which maintenance of life depends.

I distinctly remember speaking approvingly in 1890 of the Brand bath for typhoid fever to the eminent clinician of the Moabit Hospital in Berlin, B. Fraenkel, when he exclaimed "Weg mit Der Antipyrese," clearly failing to recognize the difference, the fatal difference, between the antipyretic cold bath (60° F.) of Liebermeister of Basle and the antifebrile friction bath of Brand, and condemning both because the coal tars had disillusioned him.

We stand to-day at the threshold of a similar disillusionment. One who reads carefully the current descriptions of influenza must realize that it is a disease in which toxemia is the chief manifestation. Whereas in typhoid fever we have discovered the exact bacteriological source of the disease, in this toxemia the source has not been identified: but as in typhoid fever the average doctor in the treatment of influenza is to-day handicapping the heart with new coal tars and other faulty therapy.

A clearly outstanding fact pointed out by Thomas McCrae and others is that the striking feature of the disease is to be found in the vasomotor system. Another writer, whose name has escaped me, reports from the Fordham Hospital that the manifestations of the disease present the Romberg-Paessler syndrome. The latter have, as is well known, demonstrated that in certain infectious diseases the chief danger lies in depreciation of the vasomotor center of the medulla oblongata. In their experiments it became evident that the final lethal effect upon the circulation was chargeable to paralysis of the vasomotors and not to any

damage of the heart. That this condition obtains in influenza is confirmed by the findings of McCrae, that the majority of cases of influenza had gone through the attack without serious heart involvement and that not one per cent of cardiac disease followed this infection.

The author's object in dwelling upon these well-ascertained data is to point out that the conventional treatment, as he has learned it from writings and personal intercourse with colleagues, tends to further rather than relieve the lethal factors in this disease.

Nearly every writer dwells upon the coal-tar preparations for reducing temperature and relieving pain. Large quantities of water taken internally and by hypodermoclysis are almost universally recommended with the object of diluting the toxic agent and eliminating it. The author would point out, with due diffidence, that coal-tar preparations increase vasomotor depreciation and thus handicap the action of the heart, just as the influenza poison appears to do, and that in addition the elimination of large quantities of water must overtax the heart already struggling to protect its integrity. Therapeusis not based on physiology has always failed. We have a flagrant example in the one-time popularity of venesection, which was abandoned only after an enlightened physiology exposed its futility.

The author ventures to suggest that we have in the judicious application of water below the temperature of the skin a physiological agent to counteract the depreciating vasomotor condition in this disease, as has been proved in typhoid fever. The nature and extent of the toxemia differ clinically in these diseases. The method of applying water must differ accordingly.

In influenza the vasomotor depreciation is an early manifestation and must be met at once by mild and cautiously graduated procedures, while the aim in typhoid fever is to forestall, by procedures adapted to the clinical manifestations, vasomotor depreciation which occurs in a later stage of the disease; moreover, influenza being a disease of short duration compared to typhoid fever, the procedure need not be so heroic and persistent.

In both diseases a judicious application of water prevents lethal complication; and this is its chief value in all acute diseases.

When the temperature is above 100° F., ablutions every two hours with a bath-mitten or wash-rag, wrung out of water at 80°, rapidly passed over successive parts of the trunk, will be found refreshing and stimulating. If the temperature is 102° or over, the patient should be laid on a rubber sheet covered by two sheets on one side of the bed, and treated every two hours with water at 80° (reduced at each application two or more degrees) squeezed out of a sponge or wash-rag over successive parts of the trunk down to the thighs with friction and subsequent gentle drying. If chilling occurs the procedure must be shortened and more friction applied. On account of the enfeeblement of the peripheral circulation the extremities are not treated.

When this procedure fails to improve the pulse and general condition, a three-hourly friction bath is useful at 99° F., reduced to 85° F., and later two degrees lower until 80° are reached, with an affusion of a pitcherful or basinful of water at twenty degrees over the shoulders before leaving the tub. The patient must be disturbed as little as possible by careful handling. The duration of the bath should be from eight to twelve minutes, according to reaction.

If reaction is not satisfactory, the bath must be shortened but not abandoned. Carbon dioxide may be added by dissolving the Cassebeer, Triton or Zeo preparation, and ten pounds of salt to a sixty-gallon bath —a method the author has found satisfactory in desperate cases of typhoid fever.

After the bath the patient is returned to bed, dried, and kept at rest to permit sleep, which usually follows.

An hour later, if the extremities are not cold, a compress reaching from the axillæ to the pelvis and from side to side wrung out of water at 60° F., and covered with a flannel binder an inch longer and wider, may be snugly applied to maintain the vaso-

motor stimulation. The hourly repetition of this compress is refreshing also.

The *modus operandi* of cold procedures in vasomotor depreciation has been well and ingeniously explained by Dr. Hobart A. Hare, who compares their action to sanding a slippery track for vainly revolving locomotive wheels. To ply the patient with stimulants in this condition is as unwise as to shovel coal into the boiler of a locomotive that fails to move forward on a slippery track. The latter does no serious harm, the former wears out the heart and jeopardizes the patient.

The systematic administration of one or two ounces of ice water (recorded on the chart) acts as a diuretic of great efficiency; certainly far better than large quantities for so-called flushing the system. The latter would be warranted if the human organism were a series of metal pipes. The physiological fact to be considered is that the heart must do most of the labor of eliminating the water imbibed. Being already overtaxed in this disease, life is menaced by this too popular flushing method.

When pneumonia ensues the treatment previously outlined is advised.

A brief account of three cases of influenza may illustrate the simplicity and efficiency of these procedures. When the epidemic was at its height in this city I had the privilege of seeing two cases with Dr. Albert J. Wittson:

The mother of two children presented all the characteristics of influenza with vasomotor depreciation—compressible pulse of 90 and dusky hue of her normal pink complexion, mental apathy, etc. It was impossible to obtain a nurse at any price, despite the financial ability of the patient. A colored woman who was not a nurse was found to assist us. Abdominal compresses were applied as above described. The patient's temperature being 102.5°, she was placed upon a light rocking-chair previously covered with a blanket and sheet. She was assisted in gently sliding upon the chair. Covered by the blanket and sheet, she was drawn backward to the bath tub, which had been half-filled with water at 90° F., gently placed in the bath, and friction practiced over the entire body for ten minutes. Before removal she received a basin of water at 65° F. over the shoulders and back. She was then replaced upon the sheet and blanket, wrapped, and drawn to the bed. Covered by bedclothes she fell asleep. When she awoke the sheet had absorbed most of the water; she was dried and made comfortable. After reaction was established—*i.e.*, warmth completely restored to the extremities—an abdominal compress at 60° F. was applied and renewed every hour until the next bath was due four hours later. Three of these procedures, each two degrees lower, restored cardiac integrity, refreshed the patient, and carried her to complete recovery. The patient's son, eight years of age, was similarly treated, with the same result.

Another case was that of M. W., twenty-two years old, whom I saw after a week's illness, which alarmed the parents so that they requested a consultation. Dr. Schenk, of Far Rockaway, had carried the patient through the first stage. Despite the prejudice prevalent in medical circles against "cold water," my courteous colleague consented to have abdominal compresses applied as above described. They sufficed to prevent complications. Several months later the patient called on me to express gratitude, to which his family physician was more entitled. He volunteered the information that he had not the slightest recollection or consciousness of my having seen him—evidence of the universally recognized fact that the nervous system is overwhelmed by toxemia in many of these cases.

I venture to insist that whenever such toxemia exists, or better still whenever it is a probable menace, the judicious application of *water* below the skin temperature is the prime remedial agent.

It is hoped that the above details may afford a clue to therapeutic reasoning in the application of water.

51 West 70th Street.

A NOTE ON THE TREATMENT OF INTESTINAL OXALIC LITHIASIS.

BY CHARLES GREENE CUMSTON, B.S., M.D.,

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The prognosis of intestinal lithiasis in general and that of oxalic lithiasis in particular is very benign. There is hardly ever an accident of any moment during the evolution of the affection, and I am unaware that any case of invagination or pericecal or appendicular inflammation has been recorded to date. The affection is painful rather than dangerous.

The most serious accident that may arise is intestinal hemorrhage, but it is small in amount and ceases when the sand or gravel has been expelled.

As the process has an essentially slow and chronic evolution, a careful and continued treatment is absolutely requisite, because the constant decalcification of the organism results in marked denutrition and an important nervous exhaustion. Therefore, if the patient does not die from his lithiasis his life is to some extent compromised and his organism will be the prey of infections and the most varied diseases.

The mechanical trauma and resulting erosions of the intestinal mucosa provoke occult hemorrhage which causes anemia. Chemical irritation of the gut sets up mucorrhea, at first only temporarily, but after a time it may occasion a true enteritis, which, be it understood, will not be the cause of the lithiasis but, quite on the contrary, is its consequence, and thus contributes to increase the denutrition and loss of body weight.

The treatment of intestinal oxalic lithiasis differs according to whether one is dealing with the *latent* or the painful type of the process. In the first place the painful and mechanical accidents due to calculi or gravel must be treated, after which the cause of the oxalic lithiasis is to be attended to. The latter will come under the head of the treatment of oxalic dyscrasia in general.

The treatment of the painful paroxysm is of necessity a palliative one, and is discontinued as soon as all painful phenomena have disappeared. Rest in bed with hot compresses over the abdomen is to be ordered, and one may apply tepid alcohol compresses over the umbilical region as recommended by Esmonnet.

During the intervals of the application of the compresses light friction of the abdomen should be made with some calming liniment, but if these means do not succeed antispasmodic remedies are to be resorted to, such as atropine, codeine or valerian in a potion, pills, or suppository.

In order to deal with the stagnation of sand or gravel, whose presence irritates the intestinal mucosa, and to facilitate its evacuation, mild laxatives or purgatives will usually be quite sufficient. Half an ounce of castor oil or the following may be exhibited:

℞ Magnes. sulph.,
Sodii sulph.,
Sodii phosphat., ää 5 grammes;
Sodii bicarb., 10 grammes;
Aq. bull., ad 1000 Cc.

S.: A tableglassful for a dose (Loeper).

Enemata are of unquestionable value, provided they are properly given. With the patient lying on his right side, one or two liters of liquid should be slowly introduced into the bowel with a long, flexible rubber tube. An enema of two liters should require from twenty minutes to one-half hour for its introduction. The fluid must be tepid, because otherwise it would set up a spasmodic reaction of the intestine. A physiological salt solution is advisable, but I am inclined to prefer marshmallow water made fairly thick. Oil enemata, which are certainly excellent, should be given at bedtime and retained. Not more than 150 to 200 Cc. should be injected.

To overcome the anorexia from which these patients suffer and to excite the di-

gestive functions, I know of nothing better than the following or some modification of it:

℞ Tinct. quassiæ,
Tinct. gentian,
Tinct. colombo, ää 5 Cc.;
Tinct. condurango, 15 Cc.

S.: A teaspoonful in water ten minutes before meals.

Strychnine and nux vomica must be absolutely avoided, as they may increase the spasmodic contractions of the muscle fibers of the gut, an effect that must be avoided at all costs.

The treatment of the oxalic dyscrasia is a *sine qua non* of avoiding a return of the intestinal paroxysms or other accidents due to this condition. It would require too much space to give an explanation of the reason for the indication of each medicament employed.

In the first place a diet should be selected as poor as possible in products containing oxalic acid or which are susceptible of giving rise to it. Therefore, potatoes, cereals, tomatoes, cabbage, lettuce, carrots, watercress, and all starchy foods may be permitted, as well as onions and eggs. Fats, sugar, white wines, and milk should be indulged in moderately. The waters of Vals or Vittel are indicated.

Among foods to be proscribed, those containing oxalate come first, namely, cocoa, chocolate, dried peas, rhubarb, spinach, green string-beans and sorrel; or the generators of the oxalates, namely, purins, nucleins, and other similar products, such as meat in general, the flesh of young animals, game, or animal viscera.

A certain number of foods, although not containing oxalates or their generators, should be proscribed because they may excite the cell elements, thus facilitating its formation in the midst of the various parenchymata. These are coffee, alcohol in any form (a little light white wine may be permitted), mushrooms, game, condiments, and shell-fish.

The intestinal tract must be rendered alkaline in order to diminish the absorption of the oxalates. This medication has for its object the precipitation—partially at least—of the intestinal oxalates and to prevent their absorption.

Small doses of sodium bicarbonate appear to decrease the production of oxalic acid, while larger doses have just the contrary effect. Vichy water, magnesium and chalk are frequently prescribed, the two latter for the reasons which will be given.

To decrease the formation of oxalic acid in the tissues regulated and moderate exercise, with life in the open, should be indulged in, while physiotherapy will facilitate internal combustion and cause oxidation to be complete. French physicians recommend a cure at Chatel-Guyon or Plombières as sometimes being of real value.

To neutralize oxalic acid, should it form, certain drugs are to be recommended. Klemperer advises the salts of magnesium, which he believes possess a real antidotic power. The citrate and sulphate in small doses of fifty centigrammes to one gramme in twenty-four hours may be exhibited. Likewise, the salts of calcium appear to decrease the toxicity of oxalic acid by forming a rather insoluble calcium oxalate in the body fluids. Loeper recommends sodium phosphate and citrate as follows:

℞ Sodii phosphat.,
Sodii citrat.,
Magnes. sulph., ää 5 grammes;
Aq. bull., 200 Cc.

Or:

℞ Sodii citrat.,
Magnes. citrat., ää 5 grammes;
Aq. bull., 200 Cc.

S.: A soupspoonful to be taken every morning for ten days.

To favor the elimination of the oxalate, mild purgation, urotropine at the daily dose of 50 centigrammes to 1 gramme, diuretic waters and drinks should be prescribed. By exciting the renal function, elimination of the oxalates by the urine will lessen that of the intestine. It is hardly

necessary to say that before giving diuretics it is important to ascertain if there is a sufficient renal permeability.

Calcium and phosphoric acid also facilitate the solubilization of oxalic acid and at the same time decrease its toxicity. Piperazine and its derivatives have been much lauded by some, and several writers maintain that this product reduces the degree of the oxalemia present in these patients. From 50 centigrammes to 1 gramme is given in twenty-four hours.

Loeper advises giving Vittel water with piperazine every morning on an empty stomach for ten days, and then Vichy water with sodium citrate and phosphate are given in the mornings for ten days, and so on.

One of the most serious consequences of oxalic lithiasis in general is the demineralization of the organism, and it is the intestine which serves as the exit for the lime salts. To counteract this process direct or indirect calcificants may be employed. The former contain one molecule of calcium; the latter do not contain lime, but render its fixation in the tissues easier. Both should be given by mouth and hypodermically.

For the direct calcificants the phosphates of calcium are to be proscribed, as they are not assimilable, while calcium chloride may be given at the dose of 50 centigrammes to 1 gramme.

The indirect calcificants are lecithin, phytine, sodium phosphate, and the phosphoglycerates, especially sodium and magnesium.

℞ Sodii phosphoglycerat.,
Magnes. phosphoglycerat., ää 20 centigrammes.

D. S.: For one cachet. One to be taken at lunch and dinner.

Hypodermic injections of a 5-per-cent lecithinated oil should also be given.

An excess of calcification need not be feared.

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THE PRODUCTION OF TETANY BY THE INTRAVENOUS INFUSION OF SODIUM BICARBONATE.

Harrop, in the *Johns Hopkins Hospital Bulletin* for March, 1919, states that he has been unable to find any clinical reports of tetany occurring in adults following the administration of sodium bicarbonate, but among the many accidents following its use in the treatment of diabetic coma the occurrence of convulsions, especially clonic in type, is frequently mentioned. These convulsions have usually led to a rapidly fatal termination, often in a few hours. Tetany, however, has not been mentioned or identified as such. Howland and Marriott have observed tetany in young children following the therapeutic administration of sodium bicarbonate for acidosis and cite three cases. During the period of tetany their patients showed a low calcium content of the blood serum, a condition which they have shown to be present during the active period of infantile tetany, particularly during or shortly after the occurrence of convulsions. The amount is then usually less than 7.0 mg. per 100 Cc. In the author's case of adult tetany, analysis of the calcium content of a blood serum sample taken twenty hours after the original attack showed a value higher than 9.0 mg. per 100 Cc., hence about normal, and there was no marked accumulation of phosphates (the phosphate content of the blood serum was less than 6.0 mg. per 100 Cc.). It should be noted, however, that in this case there had been no actual convulsions. It seems clear that the condition here was associated with, if not directly precipitated by, the suddenly increased alkalinity of the blood due to the sodium bicarbonate infusions.

In conclusion Harrop desires to call attention to a danger, not too remote, attendant upon the intravenous use of sodium bicarbonate in conditions in which the renal excretory function is markedly impaired, and particularly when extreme oliguria or anuria is present.

EDITORIAL.

INTESTINAL AUTOINTOXICATION.

One of the favorite theories of some medical clinicians during the past thirty years has been that numerous symptoms presented by certain patients are the result of the absorption of toxic material from the alimentary canal, and in their opinion chiefly from the large bowel. Those who have been most enthusiastic in advocating this theory have resorted to the most radical methods for the relief of the patient, even to the extent of removing a large part of the colon, an operation which we believe is now one looked upon with disfavor by the majority of the best surgeons in the world, notwithstanding its advocacy by no less a brilliant surgeon than Mr. Lane.

Even if the patients survive this radical operation, they are almost invariably changed into chronic invalids of another type and suffer from a different set of symptoms, many of which are infinitely more disagreeable than those which presented themselves at first. It is to be recalled that nature seldom makes the error of providing an organ which is incompetent to perform the work assigned to it. The colon takes up a large amount of moisture as the contents of the small intestine escape into it, but it does not take up other materials with the liquid, and those who have had colectomy performed are placed in a condition from which they suffer from chronic diarrhea and an inability to control intestinal movements.

Closely associated with this is the question of purging patients prior to operation with the idea that by cleaning the alimentary canal a certain number of postoperative symptoms are thereby put aside. Without doubt this purgation is far too frequent and too severe, with the result that the patient is weakened. A patient going into a surgical operation of considerable gravity, so far as his nervous system is concerned, closely resembles the soldier who is going into battle, and every one knows that diarrhea does not add to the bravery or physical stamina of a fighting man, but as the expression runs, "he fights best on full belly," which does not mean a full stomach, but an alimentary canal which from one end to the other contains neither too much nor too little normal contents, whatever they may be.

We are recognizing more and more the relationship between the circulation in the splanchnic area and the general circulation particularly in its relationship to shock and collapse. In other words, the question arises as to whether the patient who is subjected to operation should have a thoroughly emptied alimentary canal or one which may be considered in its normal state. Of course an overloaded bowel should be relieved.

Still more recently the whole theory of intestinal autointoxication has been seriously assailed by more than one writer, and we have on a previous occasion called attention in these pages to the fact that it is doubtful if either bacteria or their products are absorbed in any quantity from the bowel. If they are absorbed, the liver acts as a filter and destructive agent to protect the rest of the body, and if it is functionating no trouble ensues. Perhaps the most recent, and certainly the most forcible, writer on this subject is Alvarez. He bitterly attacks so-called autointoxication and thinks that nearly always this diagnosis is used as was the old diagnosis of malaria and anemia—as a cloak for ignorance. He is not a believer in so-called stasis as the cause of autointoxication, and he is particularly insistent in his statement that the symptoms presented by many patients who are often neurasthenic are not due to toxins but to other causes, and that in many instances the symptoms are due to distention of the lower bowel because it is overloaded and not because any absorption of poison is actually taking place. Indeed, he

mentions cases in which distention of the lower bowel from below has induced the symptoms complained of.

Possibly Alvarez goes too far in his statement that in sensitive people the brain is profoundly influenced by afferent impulses coming from a distended, underactive or unduly active bowel, but his paper at least has the advantage of warning us that the easy and unreliable and indeed unproved diagnosis of intestinal autointoxication should be made with the utmost caution. As he well points out, many of these people go from specialist to specialist fairly loaded down with *x*-ray plates showing the position of the abdominal organs and believing that these plates definitely indicate something radically wrong, when in reality they show only that at the moment the plate was taken the bowel was not in accord with our preconceived ideas of where it should be or how it should act.

NON-SPECIFIC THERAPY IN ARTHRITIS.

During the last few years we have repeatedly called attention to the work of various investigators who have reported remarkable results from injecting foreign protein in comparatively minute amounts subcutaneously or intravenously into patients suffering from various forms of infectious arthritis, both acute and chronic.

Our readers will remember that we called particular attention to the researches made by Miller and Jobling. Some of these investigators have reported results so beneficial as to border on the marvelous and to be difficult of belief, were it not that they were known to be persons upon whom we could rely.

Many years ago the late Dr. Alfred Stille, then Professor of Medicine in the University of Pennsylvania, repeatedly urged the foundation of a chair of the History of Medicine because he had found in a long experience that there was an immense amount of reduplication in research and that many investigations if built upon foundations already laid would reach greater heights than if they had to lay new foundations and then attempt to make a superstructure.

We are led to these remarks because comparatively recently Cowie and Calhoun have published in the *Archives of Internal Medicine* their researches upon non-specific therapy in arthritic infections with special reference to the changes in the blood consequent upon the intravenous injection of typhoid protein. In the beginning of their paper they point out that the injection of foreign protein is often followed by a reaction consisting in a chill and rise of temperature, the temperature sometimes going as high as 108°, and they intimate that the work of Vaughan in 1909, of Buchner in 1890, Krehl and Matthes in 1895, who induced fever in animals by the subcutaneous injection of bacterial and other proteins, was new at those periods.

It is interesting in this connection to point out that some years before any of these investigations were made, Horatio C. Wood, E. T. Reichert and the writer of this editorial carried out a research entitled "A Contribution to Our Knowledge of Fever and the Agents which Produce or Arrest It," and began their paper with the statements that "German investigators had shown that pepsin (that is, a foreign protein) injected into the blood would produce fever." The paper by these three investigators appeared in the THERAPEUTIC GAZETTE of September 15, 1886, nine years before the researches we have quoted, and while it dealt rather with the effect of antipyretic drugs upon fever than upon fever itself, it shows that it was known that foreign proteins would produce fever more than 33 years ago.

The paper of Cowie and Calhoun makes the interesting observation that there may be an analogy between the paroxysm which follows the injection of protein derived from dead typhoid organisms and malarial paroxysms.

As we have said, their report deals chiefly with the changes which occur in the blood

following injections of foreign protein and their research is to be regarded as of much more than ordinary interest for several reasons. In the first place they have practically opened up a new field in blood studies. In the second place they have carried out their investigations apparently with the greatest attention to the finest details, and have made observations upon so many cases over periods of so many hours as to probably make their communication classical in the literature of this subject.

It is not the place of a journal on therapeutics to enter into the details of their work, but their conclusions have direct therapeutic bearing. They find that the intravenous injection of typhoid protein—in other words, typhoid vaccine—almost invariably induces a leukopenia followed by a leucocytosis, which is associated with, but not necessarily proportional to, the fever which is developed, and that this leucocytosis occurs chiefly in the polymorphonuclear cells even in cases in which there is an initial lymphocyte increase. They believe that during the stage of leukopenia the polymorphonuclear cells leave the blood stream and enter the tissues, this being really the cause of the leukopenia, and the subsequent increase in these cells found in the blood is due to an overproduction of them as a secondary effect. They do not think that the reaction is in the nature of an anaphylaxis as eosinophilia does not occur.

Possibly the most important point is their statement that improvement in cases of arthritis is most marked in those cases in which the reaction is accompanied by considerable increase in the myelocytes, which is preliminary to the increase in the polynuclear cells.

Incidentally they think that the malarial paroxysm is due to the setting free of dead proteins, and not to the presence of new organisms, but to the death of old ones.

At various times during the last eight years clinical papers have appeared advocating the use of foreign protein in the place of vaccines possessed of no specific effect, and also reporting good results following the use of so-called phylacogens. On more than one occasion laboratory investigators have condemned this use of foreign proteins or phylacogens, which are in reality foreign proteins separated from specific germs, on purely theoretical grounds, but this paper of Cowie and Calhoun, combined with other papers which may readily be referred to, would seem to indicate that their theoretical views are wrong and that once more practical clinical observation is correct.

THE KARELL TREATMENT OF CARDIORENAL DROPSY.

We have from time to time during the last few years called attention to the advances which have been made in the study of renal disease, chiefly along the line of determining, at least in some degree, what functions of the kidney were chiefly impaired. In some instances, as we have known for many years, the chief difficulty is inability to secrete sufficient fluid. In other instances the solids are not adequately excreted, and it has been pretty well determined in some instances at least that the estimation of the non-protein nitrogen of the blood gives a better indication as to the condition of the patient and as to the treatment, dietetic and medicinal, which should be introduced than does a careful urinary analysis.

The point for emphasis is that there is no routine treatment for either parenchymatous or chronic interstitial nephritis, but that each case must be studied separately to determine with a proper degree of accuracy the functions which are chiefly disordered. One plan of treatment is of great value to one type of case and fails miserably in another, and the old idea that the presence of albumin and casts in the urine demanded a rigid exclusion of meat from the diet and indicated the free administration of Basham's mixture is exploded.

As long ago as 1865 Karell, a physician of St. Petersburg, as it was then called, reported upon 200 patients treated accord-

ing to the manner which he devised. This consisted in limiting all liquid or food taken by the patient to skimmed milk, which was not allowed to exceed one-half to one glass at equal intervals during the twenty-four hours. The temperature at which the milk was administered varied according to the taste of the patient, but it was forbidden to be taken at a gulp, and orders were given that it should be sipped. If it was found that the patient could deal with milk taken in this way satisfactorily the quantity was gradually increased, until at the end of fourteen days twice this amount was taken. The exact hours of administration were 8, 12, 4, and 8. Constipation, if it ensued, was treated by the use of an enema or by rhubarb or castor-oil. Other measures for its relief were the allowance of a few stewed prunes or toasted apples in the afternoon. In other cases coffee was allowed at breakfast. If thirst became a very pressing symptom a very little water was permitted, and if the patient was so overcome by hunger at the end of the second or third week that it was difficult to control him, he was given a little bread with salt or a small piece of dried herring.

This method was found to be distinctly advantageous in a certain percentage of cases of cardiorenal dropsy, and it has been tried out by a large number of clinicians, chiefly in Europe, and somewhat in this country. As is always the case, Karell's followers have not hesitated to introduce numerous modifications, some of them allowing an egg and zwieback at the end of the first week and at the end of the second week two eggs, but in every instance the point of impact has been that the total amount of fluid ingested in each twenty-four hours did not exceed 800 Cc. or approximately three-quarters of a pint.

An additional point of importance, in order to conserve the patient's strength, was insistence upon his remaining in bed at least for the first week and often for the first two weeks. This treatment if tried at all is indicated in those cases in which the kidneys are still able to secrete water and salts and in which the pulse is of considerable strength and the arterial pressure is not very low. In cardiac dropsy it may be employed. In interstitial nephritis there is a chance of its doing good, but in chronic parenchymatous nephritis it seldom succeeds, and from these statements it is evident that the treatment has a limited sphere of usefulness. But when it does succeed the results are often remarkable in that free diuresis which gradually begins to manifest itself, so that by the fourth or fifth day the flow far exceeds the quantity of fluid which is taken. Certain clinicians have added to the milk sugar of milk, cream, and oatmeal, but they have also emphasized the fact that marked myocardial degeneration arising from any cause contraindicates the method, nor does it seem successful when the liver is engorged. In such cases calomel is the more useful drug.

While the treatment strikes the patient as being rigorous, nevertheless he often passes from a state of almost total lack of appetite to a state of healthy hunger, partly due to the loss of excessive fluid and partly to the rest which is given to his digestive organs. The rest in bed also possesses great therapeutic value, and the small demand made by the digestive system upon the circulatory apparatus is not without its advantages.

BLOOD TRANSFUSION.

Numerous abstracts of articles written on this topic have appeared in the medical press, each representing some phase of the subject. Perhaps the most complete study on the part of an individual writer is that contributed by Pemberton (*Surgery, Gynecology and Obstetrics,* March, 1919) of the Mayo Clinic, where the practice has been a growing one and the evolution of the technique has been systematically worked out. All the Mayo work has been characterized by a determination to study from the rational standpoint new procedures which give promise of help, and to either perfect

or reject them on the basis of careful clinical trial. The continuous and increasing application of transfusion on the part of the Mayos is a strong proof of the permanent and wide value of this procedure.

Pemberton after a brief historical résumé, admirably illustrated, reports a series of 1036 blood transfusions, together with a summarization of the results, and a record of the general indications and dangers. This number of transfusions was performed on 429 patients from January 1, 1915, to January 1, 1918, in the Mayo Clinic. Five were done by means of paraffin-lined cylinders, 30 by a modified cannula-syringe technique, and 1001 by the citrate method. He observes that if blood transfusion is looked upon as a homologous transplantation of living tissue, as suggested by Hartwell, the indications may be epitomized as being those which call for lost or impaired body tissue (blood) by a homologous transplant. Definite effects of transfused blood are: restoration of the bulk of the circulating fluid; provision of oxygen and assimilable pabulum for tissues; increase of the coagulability; stimulation of the hematopoietic organs, and increase of resistance to infection by its antitoxic and bacterial properties.

In the series of cases reported there are 185 cases of primary or pernicious anemia, 149 cases of secondary anemia, 59 cases of bleeding, 25 cases of acute toxic and septic conditions, 10 cases of leukemia, and 1 case of shock. As to the primary anemias the greater number of patients, excepting those who have reached the very last stage of the disease, have received immediate benefit from transfusion; even the desperate cases for a time showed marked improvement.

As to the secondary anemias, the majority of the patients in this group were transfused preliminary to operation, with the idea of improving their general condition and thereby increasing their resistance to infection. In cases of acute, frank or concealed hemorrhage, the enormous value of replacing the lost bulk of fluid by blood in connection with efficient surgical means of checking further loss is well recognized. As pointed out by Hicks in 1869, "the want of success in transfusion lies in the postponement of the operation until too late a period." The normal quantity of blood is estimated to be one-twelfth to one-fourteenth of the body weight, and clinically the rapid loss of one-half of this amount proves fatal. Various "rules of thumb" have been offered, based upon the blood-pressure readings and hematologic estimates, indicating when to transfuse and when it is safe to wait. Dorrance considers it imperative to transfuse when the count falls to 1,000,000 red blood cells and 20 per cent hemoglobin, or below, and optional when the red cells are 1,500,000 and hemoglobin 25 per cent. De Page studied wounded soldiers, and found that when the red cells fall below 4,500,000 in three hours, 4,000,000 in eight hours, or 3,500,000 in the first twelve hours, the patient will probably die unless transfused. Others have considered the blood-pressure readings as the most reliable indicator, pointing out that systolic pressure below 80 mm. Hg. meant danger. Hicks relied solely upon clinical symptoms, especially "the obstinate jactitations and resistance to comply with our wishes in regard to treatment, coupled with the persistent indistinctness of pulse." Robertson warns us against using ordinary resuscitation measures before resorting to transfusion. Pemberton's clinical observations bear out his belief that permanent degenerative changes occur in the organism when the exsanguinated condition persists for more than a few hours.

Wilson demonstrated that the amount of hemoglobin retained in the severest hemorrhage is above the point necessary to sustain life. Unless the blood is withdrawn too rapidly, the organism replaces this bulk, substituting plasma which the body retains in reserve, and thus maintains blood-pressure. In animals bled the investigators were able to raise and maintain the blood-pressure reading by the injection of either horse serum or gum acacia (7 per cent). The effect of normal saline solution was only transient, as this quickly leaves the vessels

for tissues and urine. David and Curtis showed that dogs bled under similar conditions, until there was cessation of flow at the carotid, could be resuscitated either by injection of physiologic serum or by transfusion. However, in the eighteen hours following this experiment, 77 per cent of the dogs treated with serum died, and only 6 per cent of the animals transfused succumbed. In all but two cases in this series of acute hemorrhage the transfusion was life-saving or greatly beneficial. In the two unsuccessful cases the patients were temporarily restored, but later died, due to the continuation of the bleeding.

The results of transfusion on the weak, starved, and anemic patient, as a supportive measure preliminary to operation, are eminently gratifying, as is evidenced both by the increased ability to withstand the operation and by the rapid postoperative convalescence. In the anemic cases in which the patients are to be submitted to abdominal operation, transfusion is especially indicated. It may be safely asserted that in practically all operations in which the gastrointestinal tract is opened, there is more or less soiling of the peritoneum which potentially spells peritonitis. It is the normal resistive elements of the organism which prevent this eventuality or limit it to a small area. In those cases in which the resistance of the body has been impaired by chronic bleeding, malignancy, and chronic infection, this complication is most frequently seen. The value, then, of transfusion as a preliminary measure is illimitable.

The general oozing which follows certain operations, especially in intensely jaundiced patients, has always been a source of grave concern to the operator, who in most instances has been without efficient means of checking it. The results of blood transfusion in these cases have been strikingly good; usually the hemorrhage ceases almost immediately, and the patient's improvement is quickly obvious. In certain cases, usually of the malignant type, in which the biliary obstruction has not been relieved by the operation, the hemostatic value of the transfusion rapidly decreases, after 48 to 72 hours, and the patient may start bleeding again. Also, in the oozing occurring after operations on the stomach and intestines, transfusion alone will often be followed by complete and permanent cessation of bleeding, and the rapid convalescence of the patient. The bleeding in ulcers of the stomach and duodenum is usually due to an erosion of one of the larger vessels, and transfusion should always be considered preliminary to, or in association with, a laparotomy for the excision of the ulcer. For the postoperative bleeding in patients suffering from blood dyscrasia, transfusion is an effective hemostatic, but probably has no effect upon the ultimate course of the disease. It is of interest that, clinically, the use of an anticoagulant in the transfused blood not only does not retard the coagulability of the recipient, but possesses an equal power of hemostasis with the undiluted blood administered by the syringe-cannula method.

According to Howell, the rôle of calcium in the phenomenon of coagulation is to activate prothrombin into the formation of thrombin (fibrin ferment), which in turn activates fibrinogen into fibrin. By the addition of citrate of soda, coagulation is prevented by the chemical immobilization or stabilization of the calcium without forming precipitate. Excessive intravenous injection of citrate of soda deprives the blood and tissues of calcium, and the symptoms of convulsions, tonic and clonic, tetany, paralysis and dyspnea are the results of the decalcification of the nervous system.

From the recognition of the fact that the coagulative properties of different bloods vary in different persons, as evidenced by the occasional coagulation of blood withdrawn from the donor in a 0.2-per-cent citrate solution, they have substituted a 0.24-per-cent citrate solution.

The arm of the donor is prepared in the usual manner. A tourniquet is lightly applied above the elbow, and the median basilic or the median cephalic vein is either

punctured with a large-sized needle or exposed by a small incision, and a cannula introduced.

By means of a small, straight intestinal needle, inserted transversely, the vein is transfixed to the skin, the needle passing through its upper segment. With the end of this transfixing needle as a handle, the vein is steadied and the cannula needle, directed parallel with the line of the vein, can be readily pushed beneath the level of the transfixing needle into the lumen of the vein. The blood is received in a sterile graduated glass jar containing 30 cubic centimeters of a 2-per-cent sterile solution of sodium citrate at the bottom. While the blood is running, it is well mixed with the citrate solution by means of a glass rod. The flow of the blood should be in a steady, continuous stream, and when there occurs slowing of the stream, as is often observed with a sudden drop in venous pressure, due either to syncope or the too snugly applied tourniquet, the needle should be immediately withdrawn and a clean one inserted. If the blood is allowed to flow in an impeded stream, there will be clotting of the whole or part of the blood collected because of the incipient coagulative changes which have taken place in transit from the vessel to the citrate solution. After the blood has reached the 250 cubic centimeter mark another 30 cubic centimeters of the citrate solution is added, and the blood is permitted to flow until there are 500 cubic centimeters of the mixture. If more blood is desired, a sufficient amount of citrate solution is added to maintain this ratio of 0.24 per cent.

The blood may be carried to the recipient's room or the recipient may be brought into the operating-room. The needle is then introduced into the recipient's vein, after the manner above described, and attached by rubber tubing to a glass irrigating flask, the tubing and the bottom of the flask having been previously filled with saline solution. The citrated blood is then transferred into the flask and permitted to flow into the vein of the recipient. It is advisable to have the blood run in slowly in order to guard against suddenly overloading the right side of the heart, and in order to watch for any untoward effects upon the patient. A marked slowing of the pulse, syncopal attacks, dyspnea, cyanosis, a sensation of cardiac oppression or excruciating pain throughout the body, especially localized in the small of the back, should be interpreted as danger-signals, and if these persist after temporary stopping of the flow, it is advisable to conclude the operation at once, and another donor should be secured.

The amount of blood to be transfused should be dependent upon several factors, namely, the age of the patient, the presence of associated physical impairments, such as cardiac lesions, arteriosclerosis, etc., and the pathologic condition for which the transfusion is indicated. Unless for the purpose of replacing a large bulk of blood lost from an acute hemorrhage, the impression received from the study of this series of cases would indicate that better results are to be expected from the use of a relatively small quantity, 500 to 750 cubic centimeters, repeated in from five to seven days, rather than from a single transfusion of a larger amount.

In the selection of a suitable donor, a young, healthy, robust individual is desired. Pemberton's results tend to corroborate the observations of Peterson that the value of the transfusion is largely dependent upon the individual donor. One donor's blood may exhibit remarkable powers of hemostasis, that of another may induce hematopoietic stimulation, and that of another, owing to the presence of some antibody, may exert real antitoxic effect. The blood of every donor should be tested for syphilis and as to its compatibility in reference to agglutination and hemolysis.

Cherry and Langrock have shown, in a series of 34 tests, that the mother is always a suitable donor. However, it should be emphasized that after the first few weeks of life the child develops an independent group of its own which is not necessarily

the same as that of the mother, and accordingly tests should always be made preliminary to transfusion. In an emergency, such as that following an acute hemorrhage, when the life of the patient is dependent upon an immediate transfusion, it is justifiable to use a donor without a preliminary test. In such instances the operator should allow the first 200 cubic centimeters of blood to run in slowly.

In 219 transfusions (21 per cent) of the series, there occurred from fifteen minutes to one hour later a slight reaction of chill and fever, a temperature of 100° to 105°, with or without malaise, headache, nausea and vomiting, and diarrhea, and followed, in a small percentage of cases, on the third day after the transfusion, by an eruption of herpes. In another 15 per cent of transfusions there occurred a rise of temperature to 100° or above, not associated with chill and nausea. These were, in every instance, of a transitory nature, the temperature returning to normal in from 12 to 36 hours, and in only two instances was it at all probable that the good of the transfusion was vitiated by this complication.

In 1915, Bernheim collected data of 800 transfusions performed by 12 different operators, and reported the occurrence of hemolysis in 15 cases, with four deaths Reactions are most typical. They occur early after the introduction of 50 or 100 cubic centimeters of blood; the patient first complaining of tingling pains shooting over the body, a fulness in the head, and an oppressive feeling about the precordium, and, later, an excruciating pain localized in the lumbar region. Slowly but perceptibly the face becomes suffused, a dark-red to a cyanotic hue; respiration becomes somewhat labored, and the pulse rate, at first slow, sometimes suddenly drops as many as 20 to 30 beats a minute. The patient may lose consciousness for a few minutes. In one-half of the cases of Pemberton an urticarial eruption, generalized over the body, or limited to the face, appeared along with these symptoms. Later the pulse may become very rapid and thready; the skin becomes cold and clammy, and the patient's condition is indeed grave. In from fifteen minutes to an hour a chill occurs, followed by high fever, a temperature of 103° to 105°, in which the patient may become delirious. Jaundice may appear later. The macroscopic appearance of hemoglobinuria is almost constant. In three such instances the symptoms were not recognized at the time of the transfusion and 500 cubic centimeters of blood were injected. All the patients died, two in one and three hours, respectively, following the transfusion, and one became comatose shortly afterward and died thirty hours later. In the other nine instances the symptoms were early recognized and interpreted, and the transfusion was concluded after the injection of 50 to 100 cubic centimeters of blood. Adrenalin and atropine were administered with good effect. There was no mortality in this group.

DIAGNOSIS AND TREATMENT OF DUODENAL OBSTRUCTION.

It is the recurring experience of the operating surgeon to find a duodenum so enlarged as to suggest a mechanical obstruction. The symptoms leading to an exploration are those of gastric indigestion, with a predominance of those suggesting pylorospasm, or pyloric obstruction; and the operator is content with the performance of a posterior gastrojejunostomy with a short loop, often speculating as to the etiology of the dilated duodenum, usually without making any search for the underlying cause, or if this search be made, without coming to any definite conclusion. It is therefore of importance to the profession that the subject of duodenal obstruction should be taken up formally and discussed as to its bearings, symptomatology, and treatment. This has been done by Kellogg (*Surgery, Gynecology and Obstetrics,* February, 1919), who refers back to Dwight's series of wax casts of the duodenum made in 1897. A study of these casts shows that the G-shaped duodenum of uniform caliber

is observed only in infants. In the adult the variations in size and shape are marked. The mucosa of the first portion is like that of the stomach. At the junction of the first and second portion there is always a marked constriction. In about half the cases there is a distinct angulation at the juncture of the second and third portions, and in some instances a constriction. In most of the cases the transverse portion shows a distinct groove on its superior and anterior surface, caused by the superior mesenteric artery; beyond this an angulation at the juncture with the jejunum. There was in all cases a groove due to the pressure of the spine alone or the spine and the aorta. Some showed a fourth ascending portion which was absent in others.

It is obvious that the duodenum is a poorly drained portion of the gut. Kellogg notes that at the operating table one learns that when the first portion only is dilated the junction of the first and second portions is angulated, caused by the duodenum being drawn up close to the liver by contraction of mesenteric bands or by adhesions binding together the first and second portions, or by gastroptosis, the duodenum remaining fixed. In the second group giving dilatation of the first and second portions, this has appeared to be the result of adhesions extending from the gall-bladder or hepatic flexure of the colon.

In obstruction of the entire duodenum there is often a redundant cecum displaced in the pelvis with a short mesentery and a portion of the ileum near the cecum. It is the dropping of the hepatic flexure which causes a straight pull of the distended bowel to the splenic flexure across the point of union of the duodenum with the jejunum. The condition may exist without prolapse of the cecum.

A study of clinical cases shows two sets of symptoms—toxic and mechanical. In some cases both are present; in others one group only.

Some of the toxic symptoms are usually in evidence—*i.e.*, headache, mental depression, lack of strength, disturbed heart action, cold extremities, skin eruptions.

Headache has been most frequently present. It is usually temporal, sometimes occipital, and is constant or occurs several hours after meals. Often it is associated with nausea and may be relieved by eating.

The mental depression may be very marked. Impairment of vigor is more frequently complained of.

The disturbance of heart action may take the form of tachycardia or bradycardia or simple irregularity of action. These patients are apt to complain of bilious attacks —*i.e.*, headache, nausea, and vomiting of bile.

In obstruction of first portion only, the symptoms are those of partial pyloric obstruction without the special symptoms described below, due to interference with bile drainage.

In obstruction of second and third portions, the mechanical symptoms will vary according to the problem presenting. If the case is one in which interference is due to a prolapsed cecum dragging on the mesentery, we may find periods of comfort so long as the colon is empty, but with an attack of constipation the drag of the distended cecum inaugurates an attack. This is the mechanism of the so-called bilious attack.

The amount of resistance to back pressure offered by the pylorus will modify the symptoms. With a resistant pylorus pain is prominent; with a relaxed pylorus regurgitation or vomiting of bile is predominant. There are two distinct points of discomfort: (1) A pain or dull ache just to the left of the median line and slightly above the navel (presumably the duodenojejunal junction). This pain is frequently relieved by deep pressure. (2) Pain located to the right of the median line and above the navel, extending up under the liver and through to the back. It may be colic-like (due to peristaltic unrest) or steady and dull (due to distention), often lasting until relieved by vomiting. Frequently the pa-

tients obtain relief by deep pressure in the median line of the abdomen below the navel (presumably by unlocking the duodenojejunal kink).

Belching without fermentation may be a troublesome symptom. Vomiting of bile may follow the attack of pain, apparently the resisting pylorus giving way. In some cases the patient feels something give, the pain subsides, and vomiting or regurgitation of bile follows. Often bile works back into the stomach without pain (incompetent pylorus), and is vomited or regurgitated, or may be found if the stomach is washed.

Hayes has taught us to recognize dilatation of the duodenum by the physical examination of the abdomen. He writes as follows:

Dilated duodenum is shown by a marked tympanites in the area behind the right rectus muscle to the right of or posterior to the pylorus, and lying between the liver above and the transverse colon below. The dilated duodenum is readily mapped out by the employment of percussion with pressure. Owing to the kinking of the duodenojejunal junction the duodenum is found to be distended with gas, often two or three fingers in diameter. This duodenal inflation is frequently associated with gastric stagnation or retention.

Pressure paradox: In cases showing a dilated duodenum, pressure is made backward and upward for about thirty seconds by the hand placed just below the umbilicus, the patient being in a semirecumbent or reclining position. It might be thought that this would increase the amount of gas present in the duodenum; on the contrary, it will usually result in the undoing of the duodenojejunal kink, permitting the duodenum to empty itself, as shown by a relatively dull percussion note or marked diminution in the size of the tympanitic area. At the same time it is often possible to hear and feel the gas escape as it rushes into the jejunum.

The *x*-ray reports of duodenal obstruction are lacking in uniformity; involvement of the first portion is generally recognized, but of the entire duodenum less frequently. This is probably due to the fact that the duodenum is in part overlapped by the stomach and is not easily demonstrated except by special technique. The procedures suggested by Quimby which seem to help in this demonstration are to massage the stomach vigorously, forcing the bismuth into the duodenum, and to hold the stomach up toward the dome of the diaphragm while the picture is being taken. It should be remembered that considerable obstruction may exist without marked dilatation if the pylorus is not resistant, and that in the type of kink at the duodenojejunal junction due to prolapsed cecum and hepatic flexure, a preliminary cathartic may result in a failure to demonstrate the condition.

The majority of cases do not require surgery. They are amenable to the treatment given for enteroptosis or intestinal stasis: abdominal support, sleeping with foot of bed elevated, resting after meals in recumbent position (bed elevated), abdominal massage, colon irrigations, duodenal irrigations, mineral oil, cathartics, rest cure, combined with forced feeding.

The abdominal support should be applied with a view to lifting up the transverse colon and so liberating the kink. The type of support will be like that for gastroptosis, varying somewhat according to shape of abdomen.

For the thin retracted abdomen the Curtis-Lane supporter is the most satisfactory, while the pendulous protuberant abdomen can be held up by any belt or binder that produces its maximum pressure just above the pubes and iliac crest. For temporary support the adhesive plaster belt (Achilles Rose) will be found very useful. Sleeping with the foot of the bed elevated eight to twelve inches is an important therapeutic measure.

By this procedure the drag of prolapsed intestine ceases and the duodenum has an opportunity to empty completely and thus to minimize the infection and irritation.

Resting after meals in the same position is helpful for the same reasons.

In applying abdominal massage the object is to empty the cecum and ascending colon and unlock the kink. The patients are instructed to press the abdomen backward and upward below the navel with the left hand, while with the right hand pressure downward is exerted over the duodenum. For the colon, pressure is exerted upward on right side, transversely at level of navel, and downward on the left. A massage ball weighing six or eight pounds will be a great aid in carrying out this treatment successfully.

The rest cure and forced feeding check the duodenal irritation and infection and diminish pressure on the duodenum by increasing the amount of adipose tissue in the abdomen. Codman has pointed out that fat people have less pressure on the duodenum than thin people, for the fat in the mesentery distributes the pressure, while in thin people the main trunk of the superior mesenteric artery presses the duodenum directly against the bodies of the vertebræ.

Duodenal irrigations furnish a means of combating the duodenal infection and irritation, and at the same time help to control the general intestinal toxemia.

The surgical procedure will vary with the cause and degree of obstruction.

In obstruction of the first portion only, dividing the adhesions transversely and suturing longitudinally, so as to drop the duodenum, may be indicated, or if the stomach is prolapsed the shortening of the gastrohepatic omentum by Beyea's operation relieves the obstruction. In obstruction of the second portion it is usually a problem of treating adhesions.

Involvement of the entire duodenum, if not too far advanced, may be relieved by right-sided resection of the colon or plication and anchoring of the same, by supporting the stomach and transverse colon (operations of Beyea and Coffey), or by division of adhesions.

Gastroenterostomy has been performed, but the procedure is obsolete in spite of the fact that the case was benefited. When dilatation is marked the operation of choice, either alone or accompanied with other indicated procedure, is that of duodenojejunostomy.

In this series there has been no mortality, and in every case there has been either improvement or complete relief of symptoms, although sufficient time has not yet elapsed to speak definitely of end-results.

The procedure is only a little more difficult than gastroenterostomy; the technique is much the same. The point of approach is through the transverse mesocolon to the right of the vertebral column. The duodenum can be easily mobilized by blunt dissection, but this is seldom necessary since the dilatation causes it easily to present at point of operation. The convalescence is usually uneventful.

Acute postoperative dilatation of the duodenum is usually preceded by a chronic condition and may be prevented by correcting the latter. Vicious circle after gastroenterostomy is due to duodenal obstruction already present or produced by the operation.

In performing gastroenterostomy, if the duodenum is dilated, a duodenojejunostomy should supplement the procedure. Many so-called bilious attacks may be caused by obstruction of the duodenum, following constipation and the drag of a prolapsed cecum.

Chronic duodenal obstruction probably predisposes to duodenal ulcer. In operating for duodenal ulcer when the pylorus is not obstructed and the duodenum is dilated, duodenojejunostomy is the proper surgical procedure.

Though the operative surgeon in general may not be inclined to accept the dicta laid down by Kellogg in entirety, or even in major part, and though he may not be convinced by case reports, he will recognize the fact that this represents at least an effort to classify into rational symptomatology cases of duodenal obstruction, to search for the underlying cause, and to apply a mechanical solution not particularly difficult.

VENEREAL DISEASE CONTROL IN MASSACHUSETTS.

Massachusetts began the report of gonorrhea and syphilis February 1, 1918. In the ten months following this there were altogether 10,000 cases reported—some 7000 odd of gonorrhea, 3000 of syphilis. These cases reported by number only, the name of the patient becoming known should he lapse treatment and in the judgment of the physician become a menace to the public, whereupon the State Department is prepared to take up the supervision of the infected individual.

State approved and subsidized clinics are being established in twelve cities selected with a view to their accessibility.

Arsphenamine, manufactured in the State laboratories, is available for all these clinics, in amounts, for the present, limited to the treatment of infectious cases of syphilis. It is obvious that the reporting is honored in the breach rather than in the observance. Nor does there seem to be a progressive increase in the number of cases reported month to month, since in March 1358 was the total number, whilst in November 1136 were recorded. There can be little question as to the advisability of some form of reporting. Evidence is yet wanting to show that a form acceptable to the profession and serviceable to the public has been devised.

REPORTS ON THERAPEUTIC PROGRESS.

THE CAUSE OF THE REACTIONS FOLLOWING TRANSFUSION OF CITRATED BLOOD.

DRINKER and BRITTINGHAM, in the *Archives of Internal Medicine* of February 15, 1919, state that their interest in this question arose from a desire to get information on the best type of blood modified for injection which could be prepared. If it were true that the plasma from blood which has passed through the manipulations necessary for collection contained all or most of the toxic products involved, the problem would be simple. A non-toxic blood, always excepting detectable disasters from agglutination and hemolysis, could be obtained by simple washing of compatible red cells. Unfortunately the reverse is true, plasma being non-toxic and cellular elements varying in toxicity. They believe that one element in the appearance of this toxicity resides in the plates, which begin to become abnormal as soon as they leave the vessel. The grade of abnormality of these elements depends to some degree on the extent and skill of the handling which they are compelled to undergo in varied methods of transfusion. On this phase of the causation of reaction will depend the fact noted by others that dexterity in any type of transfusion means fewer reactions. The change which the plates undergo is not evidenced by any characteristic morphology, nor is it possible to get a high percentage of reactions from plates alone.

But here one is faced by two difficulties. The first is the impossibility of getting all of the plates out of a blood collected for transfusion and manipulating them so that injection is safe. Their extraordinary agglutinative power makes it very difficult to obtain fair sized injections of washed plates which are free from large masses. Second, the thromboplastic material which the plates present makes a proper degree of hesitation necessary, since intravascular coagulation is too dangerous an outcome to be viewed lightly. The platelet injections which they quote are the result of a gradual increase in dose, and the reactions obtained have required the maximum yield of from 500 to 650 Cc. of citrated blood. Such injections always contain many leucocytes, but their experience has never pointed to these elements as important factors in the development of toxicity. Finally, in regard to the plates and leucocytes, it should be noted that they have no tests for

agglutination or lysis of these elements, and the possibility that unexpected incompatibilities may reside in them should be borne in mind.

If we consider that their efforts to remove plates from citrated blood by differential centrifugalization have been successful, and histologically they are so, it is evident that red cells exposed to citrate in collection are more apt to cause reactions than those taken from defibrinated blood and subjected to a comparable amount of washing, 40 per cent of reactions occurring in the first case and 20 per cent in the second. If to these last cells citrate is added as the single difference in their treatment, the reactions again become 44 per cent. Citration, therefore, seems to harm red cells, and possible direct evidence for this exists in the occasional promotion of fragility by this substance. The indication is that hemolysis contributes a certain number of reactions, but that this hemolysis is too slight to be detected by direct methods.

The results with plasmaphoresis confirm their transfusion experiences in so far as injection of washed whole cell blood is concerned. There is, however, a wide discrepancy between plasmaphoresis using citrated blood with platelet elimination, and transfusion embodying similar maneuvers. In these latter there is no possibility of cellular incompatibility so slight as to be unrecognized. If citration results in greater cellular fragility, it will do its minimum of harm in these injections, whereas in transfers between different individuals it is possible that an influence which promotes fragility even very slightly may result in a degree of hemolysis of sufficient magnitude to cause reaction. They have suggested that the cases of chronic nephritis which have been subjected to plasmaphoresis may be less reactive than are the anemics. Without transfusion of a series of these cases no definite statement can be made. Certainly in their hands cases of secondary anemia from simple bleeding or from bleeding plus carcinoma have reacted as freely as have the cases of primary anemia. The final factor of the individual in these reactions is as yet almost unknown. The tests for agglutination and hemolysis present a certain amount of valuable qualitative information in this direction, but beyond these they cannot go.

Drinker and Brittingham summarize their article as follows:

1. Reaction figures are given for various methods of transfusion. Those for the citrate method are widely divergent, but in the main exceed the results obtained by paraffin tube or syringe-cannula methods.

2. A rise in temperature of 2.5° F. is suggested as the best criterion of a reaction. The technique used in citrate transfusions is discussed.

3. The number of reactions bears no constant relation to method of citration or specimen of citrates.

4. Citrated plasma free from formed elements is non-toxic in compatible individuals.

5. Washed whole cell content of blood is uniformly toxic, whether injected into the individual from whom the cells have been removed (plasmaphoresis) or into different individuals who have been tested and show no agglutination or hemolysis of red cells.

6. Removal of the plates and two-thirds of the leucocytes from citrated blood by differential centrifugalization with final suspension of the red cells in freshly made sterile physiologic sodium chloride solution has resulted in 40 per cent of reactions in thirty transfusions.

7. Removal of the plates and a comparable number of white cells by defibrination, with thorough washing and suspension of the red cells in similar saline solution, has resulted in 20 per cent of reactions in fifteen transfusions.

8. Addition of citrate from one to two hours before injection to transfusing blood has resulted in 44 per cent of reactions in nine transfusions.

9. While the totals of the different types of transfusions which have been employed are not large, it appears that three elements make up the final total of reactions in citrate transfusions: (*a*) very rare gross incompatibilities which escape detection *in vitro;*

(*b*) changes in the plates, part of the process of coagulation; (*c*) direct action of the sodium citrate on red cells promoting hemolysis.

ASTHMA OF NASAL ORIGIN.

BARNHILL, in the *Indianapolis Medical Journal* for February, 1919, states that the treatment of asthma of nasal origin is successful in a majority of cases. As in many other diseases, success depends upon reasonably early diagnosis and surgical treatment. When untreated until serious changes in the bronchioles have occurred all treatment may prove unsatisfactory. Surgery directed toward the removal of nasal obstructions, including the hypersensitive nerve terminals which supply such areas, supplemented by therapeutics and followed sometimes by sojourn in a suitable climate, have cured a large percentage of cases. Often the cure of a case is a purely surgical problem, but one that is far from simple. Not infrequently the interior of the nose must be completely renovated and changed. In some cases one must deal surgically with a much-deformed nasal septum, hypertrophied turbinates, and ethmoidal inflammation, or perhaps with ethmoidal degeneration with polypi. When the nasal disease is so extensive one or more of the nasal accessory sinuses may be, and often are, empyemic. In all such cases the patient has constant cold in the head, with great distress from nasal stoppage and sneezing. Nasal infections are frequent, and these spread quickly to the larynx, trachea, and bronchi, with asthmatic attacks. In this type of case nasal sprays, especially those with a watery base, do harm. Internal medicines and climate are but palliative, but well-directed and thoroughly executed nasal surgery is imperative and curative. All the necessary surgery may not be done at one operation. Sometimes several operations may be necessary, as a submucous resection of the nasal septum, a complete ethmoid exenteration, and finally a radical operation on one or more nasal accessory sinuses. In some instances even more is required, for not infrequently the adenoids and tonsils must be removed, and sometimes also pyorrheic or decayed teeth. The surgical aim is to break up the oversensitive nerve relationship between the nose and bronchial tree, and to prevent in so far as is possible any further infection of the lower air spaces through the presence of infection in the numerous foci of the nose and throat. These operations are often major. They should be performed in a hospital.

All cases require the help of the internist. Many have heart and kidney affections. Most of them require a rigid regulation of diet and exercise; some must have change of climate, and proper advice on this point requires a thorough knowledge of the disease and a wide information regarding the climatic value of many lands. Climate in the class of cases here mentioned is of no permanent value until the nasal disease is surgically removed and until the physical state of the patient is at least partly corrected; then it may be and he believes often is permanently curative.

PITUITARY HEADACHES AND THEIR CURE.

PARDEE, in the *Archives of Internal Medicine* of February 15th, 1919, states that pituitary headache has three characteristics: its location; its duration and persistence; and its relief under specific medication. A patient will come to the physician complaining of frontal headache. On questioning further he will say that it is situated "deep in the forehead behind the eyes," often feeling as though it were pressing on them, giving a "dazed" sensation. Not infrequently, without asking, and always on asking, the patient places the finger on either temple, pointing directly inward at the hypophysis. Depending on its severity, it is described as a tightness between the temples, a feeling of pressure or distention, or an intense, bursting ache. Rarely they complain that there is a sensation of "something in there," and on moving the head they may feel as though "a marble-like object were rolling about." Deep

pressure on the temples may elicit some tenderness.

This headache is very persistent, usually lasting from one-half hour to forty-eight hours, and it may be continuous, frequently coming on in the female at the time of the menses. It often leaves very suddenly, returning again with exacerbations; it is accentuated by excitement, stooping over, and by the ingestion of sugar. At the climax of the headache we may see nausea and vomiting, with which there will come relief. Marked fatigue accompanies the headache, the patient hardly being able to drag himself about, and there is present to stroking a broad white skin line as evidence of suprarenal deficiency caused by the drain on the adrenal function by the exhausted pituitary. The patients feel slowed down in their activity, yawn excessively, are sluggish, and willing at any moment to seek an opportunity for sleep. These patients are particularly prone to attacks of depression, which come on without any cause, and have as their basis some very insignificant fact. In children there is apt to be evidence of mental retardation, with dulness, sluggishness of the mind, and lack of the higher reasoning powers, this usually occurring in hypopituitary conditions, while in adults we sometimes see a loss of moral control, resulting in frequent visits to the police courts. The menstruation has certain characteristics in these pituitary individuals. It may begin very early, at the age of 10 or 12, or else very late, at 16 or 18. The periods are irregular, often coming every two or three weeks, and the flow excessive. Sexual development may be very precocious in hyperpituitarics. Polyuria is occasionally present and constipation frequently accompanies the height of the headache, with diarrhea at its termination.

Knowing that the pituitary, together with the adrenals, controls the mobilization of sugar in the body, it is not strange that these patients should have anomaly of sugar metabolism, as is seen in the periodic development of an intense craving for sweets, a sort of dipsomania, as it were, for sugar. The satisfaction of this desire being completed by eating candy, it is almost invariably followed by a typical pituitary headache. We can readily see that owing to the increased demand on it, there is an enlargement of the pituitary gland, and following on this the adrenals are called on to assist in mobilizing the sugar, the excessive drain on them causing great fatigue and the formation of a vicious circle.

How, then, are we to recognize these cases and tally their physical signs with the symptoms enumerated? Do we expect to see finished acromegalics or giants, or adiposis with sex regression? No! but there are certain dyspituitary signs which are of aid in diagnosis.

The growth of hair has certain peculiarities; it is more apt to be dark and coarse in texture. The amount is abundant, the arms, legs, and body being covered with a quantity of hair; the pubic hair not infrequently is of masculine type in the female, growing up to the umbilicus in a triangular fashion, and in the male it may be of the female type, straight across over the mons veneris. The eyebrows are heavy and long and they often meet in the midline over the nose, forming a nasal eyebrow. The female may show a tendency to a mustache. The bony framework is altered, there being either excessive length or breadth of bone, depending on whether or not the epiphysis has united when metabolism was disturbed. The appearance of the face might show one or all of the following: eyes too close together or too far apart, a large nose, prominent superior maxillæ, a prognathism of the lower jaw, a general coarseness of the features with thickening of the lips. The teeth, especially of the upper jaw, are either widely spaced or else unusually broad. These persons are sometimes very tall, with large hands and feet, and there is a broadening of the hands, with clubbed fingers. Deposition of adipose tissue may be excessive. Pulse and blood-pressure are both apt to be low, especially during the headache, this being more an expression of adrenal exhaustion than pituitary. Blood-sugar determination and sugar tolerance will in most of these cases

reveal either too high or too low a figure. A contraction of the temporal fields of vision is occasionally found and, rarely, a primary optic atrophy.

Specific remedies for the cure of disease constitute the treatment *par excellence,* and modern medicine has given to us a number of such agents; for example, arsphenamin for syphilis, the employment of serums in pneumonia and epidemic meningitis, thyroid in myxedema and cretinism, etc. Such a specific is the administration of pituitary to cure pituitary headaches.

There are a number of good pituitary preparations on the market. Pardee commonly uses tablets in doses varying from ¼ grain to 2 grains three times a day; an average for an adult is one grain, preferably given one hour after meals. Much larger doses are recommended by some authors, Cushing giving as much as 15 grains in some of his cases. For a more rapid action it is claimed that hypodermic injection of pituitary extract, 0.5 to 1 Cc., is valuable, but he has seen better results with preparations of the whole gland.

Continuous medication with pituitary will result within a few days in a decrease in the intensity of the headaches; there will be a longer period between their occurrence, the head will feel less "tight," and fatigue, nausea, and vomiting will also disappear. An examination of the case reports given later will show very gratifying results. A number of these cases cure themselves, but it is the belief of Timme that the person who has a small sella turcica with dyspituitary signs and symptoms will remain so indefinitely, even though pituitary administration helps toward relief; but if the sella is large and there is room for expansion, there will occur the foregoing type of symptoms and the patients will eventually cure themselves, even though they become acromegalic in the process. We can therefore regard symptomless acromegalics as a finished product, according to this investigator.

But there are also those cases which, having symptoms of pituitary disease, do not improve on treatment, and it is then that we must begin to consider the possibility of a neoplasm and careful observation becomes essential.

A word of caution against too long-continued pituitary therapy. After the symptoms show improvement, diminish the dose and give it only three or five days out of the week; this gives the gland a chance to readjust itself.

Case reports follow, and as they are all from clinic patients, it has, unfortunately, been impossible to have blood-sugar and sugar tolerance tests made.

Pardee concludes as follows:

1. Pituitary disturbances constitute a fairly common cause of headache.

2. Pituitary headache is located between the temples, deep in behind the eyes, and is accompanied by dyspituitary signs.

3. Abnormality of the sella turcica is demonstrable in almost every case of pituitary disease.

4. Administration of the whole gland cures these headaches and the accompanying symptoms in a large percentage of cases, provided there is not a progressive neoplastic growth.

PROHIBITION AND AFTER.

The *Medical Record* of February 22, 1919, asserts that when prohibition becomes an established fact, the pretense that the consumption of light wines and beer in even the most moderate amounts is physically injurious will no doubt be dropped, and a new crusade will be started against some other social habit—probably smoking. And then there will not be wanting well-meaning but irrational medical men unable to see the difference between use and abuse and deducing from exceptions the rule, who will declaim against the evils of tobacco, and maybe at some future business meeting of our national medical society a resolution will be passed regarding the injuriousness of the cigarette, and this will be published as the deliberate scientific judgment of the greatest body of physicians in America. Then, after many days, the pendulum will swing back again.

TREATMENT OF MALIGNANT DISEASE BY COMBINED METHODS.

In the *Pennsylvania Medical Journal* for February, 1919, PFAHLER discusses very briefly the principles governing the combination of one or more of the four methods which he has mentioned in the treatment of malignant disease. The fact that we are not always successful in the treatment of malignant disease by any single method is sufficient proof that that method is lacking in some respect. It is with the hope of meeting this condition that the combination of methods is desirable. He believes that whenever practical the carcinomatous tissue should first be destroyed by electrocoagulation. When this is not practical because of its location, or because of the blood-vessels or nerves in the neighborhood of the disease, or of association with glandular disease, the lesion should be excised surgically and as widely and as far from the disease itself as is practical. No matter which method of direct elimination of the disease is used, deep roentgentherapy should follow on the excised or destroyed area, or on the glandular area leading therefrom. In fact, it is desirable in many instances to precede the destruction or excision by thorough roentgen-ray treatment. Lesions involving the lower eyelid can generally be treated by the roentgen rays alone and thus avoid the ectropion or deformity of the eyelid which is very likely to follow any local destruction or excision. When local healing by the roentgen rays cannot be expected it is better to risk the deformity, or even to sacrifice the eyelid, than to permit the disease to continue. If the disease involves the mucous membrane of the mouth it should be thoroughly destroyed, radium application should be made within the mouth, and deep roentgentherapy should be used by cross-firing methods externally and over the glandular area leading therefrom. If the disease also involves the jaw-bone or the metastatic glands under the jaw, the surgeon should be called on to excise a portion or all or half of the jaw, or the metastatic glands when they are present. This should then be followed by active radium therapy internally and roentgentherapy externally. In these cases one can, to great advantage, utilize the whole four methods.

If the above principles and instructions are carried out skilfully and thoroughly, we may expect the following:

1. All superficial epitheliomata should be cured.

2. Practically all early epitheliomata of the lower lip will get well.

3. Most of the epitheliomata within the mouth, if treated early, may be expected to get well. If treated late, the results will be proportionate to the delay in instituting thorough combined treatment.

4. Carcinoma involving the breast should show twice as many recoveries as may now be expected from any single method of treatment.

5. Carcinoma of the uterus should give doubly good results as compared with any single method of treatment.

6. If the precancerous lesions, such as warts, moles, slowly healing ulcers, fissures and benign tumors are eliminated early, the number of cases of carcinoma needing treatment will be tremendously reduced.

EPIDEMIC CREBROSPINAL MENINGITIS.

CAMAC and BOWMAN, in the *Archives of Internal Medicine* of January 15, 1919, state that the early diagnosis of this disease is of the greatest importance, as danger of infection of others is thereby lessened, and by early treatment the patient has the best chance of recovery. In many cases, early diagnosis is only possible by lumbar puncture, which, if properly done, is a comparatively simple and a relatively safe procedure. Cases of fever and delirium with no other physical signs should have this done. They believe that when performing a lumbar puncture 20 or 30 Cc. of antimeningococcus serum should be given.

Not only is early treatment important, but intensive treatment should be started at once. Two intraspinal treatments of from 20 to 30 Cc. should be given every twenty-

four hours. The intraspinous treatments should be given thus for the first few days, and decreased as the patient improves clinically.

As to the use of intravenous treatment, while they do not feel justified in drawing any final conclusions, their feeling has been that all patients who come in with marked toxic symptoms, and all who are doing badly, should be thus treated. Fifty or 60 Cc. are given intravenously as often as once in every twenty-four hours. Very commonly a chill, followed by a rise of temperature to 103°, 104°, or even 105°, occurs, but this is often followed by a drop to normal or even subnormal, and should cause no alarm. Herrick has reported the successful use of intravenous meningococcus serum at Camp Jackson.

One of their cases indicates that the intravenous treatment will at times bring about favorable results when the intraspinous method seems to fail.

As to when all serum therapy should be discontinued, it is very difficult to decide. In this connection the temperature is of practically no value as a guide. Normal or subnormal temperature may be present at the onset or during the first few days, while fever may be due to the effect of the serum. The two most reliable guides are the spinal fluid and the general condition of the patient. Treatment should not be discontinued until the spinal fluid is clear and free from meningococci, and not until the patient is clearly in much better condition, free from delirium and toxic signs. Serum sickness, which was present in practically all of their cases, may cause headache and fever and be mistaken for actual symptoms of the disease itself. The presence of a rash, usually urticaria, and pain in the joints, will often serve to differentiate the two states.

A safe way is to omit serum treatment for one day, then for two days, and if the patient continues to improve, discontinue it entirely.

One thing to bear in mind is that serum is the only method of treatment, and that if properly administered it cannot cause any permanent symptoms. Serum sickness is not a contraindication to further treatment. Therefore, give serum as soon, as frequently, and in as large doses as possible.

The method of serum administration they used was as follows: The patient lies on his side, with his back at the edge of the bed. The knees and hips are flexed as far as possible, and the back bowed out. Opisthotonos increases the difficulty of successful puncture. Often ¼ grain of morphine, one-half hour before treatment, relaxes and quiets the patient. In some cases it is necessary to use chloroform. The operator should wear gloves to protect both himself and the patient. The amount of fluid that should be removed varies not only in individual cases but in the same case from day to day. With the spinal fluid under pressure one of the authors twice removed 70 Cc. in twenty-four hours. In some cases with decreased pressure he was unable to remove more than 12 Cc. because of the patient's complaining of such excruciating headache. In these latter cases, injection of the serum immediately caused a disappearance of the headache. Usually from 20 to 30 Cc. of serum was given intraspinously, 40 Cc. being the largest dose. If the serum would not flow freely, slight pressure from a syringe was used to force it in.

For the extreme delirium, morphine and chloral may be used freely. When one realizes the energy a restless, delirious patient uses up every twenty-four hours, and the long-drawn-out character of the disease in some cases, it seems wise to save the patient's energy as well as to make him comfortable by the use of these drugs.

The diet must not be neglected. It is common to order "liquid diet" for febrile and delirious patients. The high caloric diet as in typhoid should also be applied to meningitis. They found that one overactive, delirious patient, who was twisting and turning in bed night and day and talking incessantly, was using twice the energy of the average well man, and was receiving less than 1000 calories a day. After a conference with their dietitian, a special diet was arranged for all their patients, which,

of course, varied a great deal in individual cases, but which averaged from 2000 to 2500 calories. Attention to or neglect of this may turn the scale in desperately ill patients.

THE UNDEVELOPED UTERUS.

BONIFIELD, in the *New York State Journal of Medicine* for February, 1919, states that in the cases that menstruate infrequently he has obtained good results by giving thyroid extract for two or three weeks, then stopping it and giving ovarian extract for a week. In the more severe cases he has the patient report at his office on the day before menstruation is expected and gives her a hypodermic injection of corpora lutea. He finds that two ampoules is the proper dose. The patient is instructed to partake freely of hot drinks and a hot sitz bath before retiring, and if menstruation does not appear the routine is repeated the second, and, if necessary, a third day. Then if menstruation does not appear the patient is put back on thyroid until the following period is expected, when she reports again for treatment. Frequently after these patients are made to menstruate a few times, the hypodermic medication can be dispensed with, but the thyroid and ovarian extract must be kept up until the habit is well established. He usually starts these patients on a dose of 1 gr. of the thyroid extract three times a day, to test their tolerance, and for many of them this is ample, but some will require more. If these patients are excessively fat, he reduces the weight by diet and exercise. Dilatation, curettage and packing will sometimes greatly benefit the case in which the lack of development is most evident.

The writer recalls a case that consulted him for dysmenorrhea which was about twenty-five years old. He did this operation for her, and she was much relieved for about two years. Her symptoms then recurred, and he repeated it. She was again relieved for several years, when menstruation first became scant, then painful, and it was necessary to operate again. This time she was relieved for about five years. Menstruation then became less and less and finally disappeared, though she suffered the pain each month. The flow was reëstablished by again doing the same operation. A few years later she developed a fibroid, and he did a supravaginal hysterectomy, thus bringing a most interesting menstrual history to an end. This was thirteen years ago, so this patient did not receive the glandular extracts. Could she have the sexual stimulus of marital life he thinks the repeated curettings would not have been necessary. Matrimony does sometimes apparently complete the work the physician has begun, though one rather hesitates to advise it, for her marriage would be sterile and therefore an unhappy one. If such a patient does become pregnant, abortion may occur in the early months, but subsequent pregnancies will usually go to term.

In conclusion it may be said that there are a few cases in which all our efforts are in vain, and the only relief for the dysmenorrhea is removal of the ovaries.

ETHER AS AN ANTISEPTIC.

The *Interstate Medical Journal* for February, 1919, reminds us that while the French medical press abounds in reference to and descriptions of the use of ether as an antiseptic dressing, the literature published on this side on this subject is extremely meager. Partly, no doubt, this is due to the quasi-chauvinistic character of the press-agent work in laudation of the Carrel-Dakin technique. Ether, as a dressing, seems to be a French idea.

So far as it has received notice on this side, it has chiefly been in connection with extensive and increasing use for washing out wounded knee-joints, being used either alone or in conjunction with saline solution. It is by no means limited in its utility to these special cases, and appears to have conquered the first place in the estimation of French surgeons as the antiseptic of choice. This is due to its detergent, penetrative, antiseptic, and cytologic action.

There is no doubt of its high penetrative action, and its known properties would seem to foretell a detergent action such as is claimed for it. It is, in wound conditions, a powerful antiseptic. One of its great advantages is that it permits of renewal without disturbing the dressings, a point of no little importance in war or rural surgery. It causes no soddening of the tissues. As applied to boils and carbuncles, it limits extension, and causes the formation of true pus, evacuable through a puncture or small incision.

STUDY OF ETIOLOGICAL FACTORS BEARING ON THE THERAPEUTICS OF BELL'S FACIAL PALSY.

LEINER, in the *Medical Record* of February 22, 1919, claims that the general practitioner who sees these cases early should appreciate what great benefit he can give his patient by immediate counter-irritation in back of the lobe of the ear. Needless to state, cold should never be applied to relieve the congestion. Oppenheim tells of bringing on a Bell's palsy by applying ice to a patient of his who had tonsillitis.

Tincture of cantharides in flexible collodion is one of the best and most practical counter-irritants. In Leszynsky's clinic this is used as a routine measure in these cases. Unquestionably, the ultimate prognosis could in many cases be favorably influenced by this simple measure, if seen early.

Involvement of the orbicularis palpebrarum prevents the eye from closing, which is not only an annoying and troublesome symptom but may cause a drying of the cornea, conjunctivitis, etc. The eye should be bathed in a mild, warm antiseptic solution, and if inflamed a 10-per-cent argyrol solution should be used. At night he instructs the patient to use a piece of cotton dipped in a mild antiseptic solution, which should be applied to the eye and covered with a bandage. During the day he uses a black piece of cloth or kid leather attached to a string, to cover the eye. For very troublesome buccinator interference a metal hook can be placed under the upper lip, this in turn being attached to the cheek by means of adhesive plaster.

During the first ten days to two weeks no electricity should be given whatsoever. But about the end of this time a test should be made electrically to determine the amount of damage done. If faradic irritability is present in any degree, a more favorable prognosis is in store for the patient. He has seen these patients get better within two weeks.

If the muscles do not respond to faradism, and galvanism shows a reaction or degeneration, the prognosis should be guarded, and it often takes from three to six months to improve. For treatment, the make-and-break circuit should be applied to the motor points of the face at least three times a week. From one to six milliamperes should be used. If, after several months, a tonic contracture of the muscles sets in, then all electricity should be stopped. Warm packs should be applied and effleurage should be given to aid relaxation, if possible. A professional masseur would be the best adjuvant for this procedure. Balls placed beneath the cheek have been used, but Leiner believes this helps very little to relieve this tonic contracture. Needless to state that the patient's general health should be looked after and improved whenever indicated.

If a case becomes chronic—that is, if after a year's treatment the condition is stationary—then the patient should resort to surgery. The facial nerve is severed and the central end is joined to the peripheral end of the hypoglossal nerve. There is, of course, a coincident paralysis of the tongue on one side, but this leads to very little interference either in speaking or eating, in view of the interlacing and intertwining of the muscle bundles of the tongue.

Leiner concludes his article as follows:

1. Bell's facial palsy occurs comparatively more often on the right side; this is shown both anatomically and clinically.

2. It occurs twice as many times in the female as in the male.

3. It occurs more often between the months of April and September, inclusive.

4. Because of the last mentioned fact the primary etiological cause is exposure, and this factor also enters in those cases occurring during the winter months.

5. Counter-irritation should be the earliest and proves the most efficacious remedy if the case is a primary facial palsy.

6. All electricity should be immediately stopped when the first symptoms of contracture appear.

7. Electricity (galvanism) is the only treatment in chronic cases, and should be employed even up to a year after the onset of the paralysis, providing there is no tonic contracture of the musculature. He has seen cases that have gotten better after a full year's treatment.

SCOPOLAMINE-MORPHINE NARCOSIS OR TWILIGHT SLEEP.

WALLACE, in the *Edinburgh Medical Journal* for February, 1919, concludes that scopolamine-morphine narcosis is a great boon to the lying-in woman. He says it is a perfectly safe and efficient means of managing labor, when intelligently used, thereby differing from many other observers.

It is of special value in primiparæ, in whom, as a rule, the first and second stages are long and painful; and in a prolonged second stage due to a large head or contracted pelvis, as it allows head molding and dilatation of the maternal parts to proceed easily and gradually, without exhausting the patient. From the work that has already been done in perfecting this anesthesia, Wallace states there is not the shadow of a doubt that the treatment has come to stay, and that it will be an unqualified blessing to the motherhood of the future. He also adds that there are obstetricians even now who would as soon consider performing a surgical operation without an anesthetic as conducting a primiparous labor without scopolamine-morphine narcosis.

The only contraindication to the use of twilight sleep is personal idiosyncrasy. Idiosyncrasy occurs in a small percentage of cases in which scopolamine acts as an excitant rather than a sedative.

Absence of exhaustion after difficult and prolonged labors is one of its greatest advantages.

As now, more than ever, the importance of motherhood is being realized by the state, Wallace believes that twilight homes should be established all over the country, where lying-in women could have the best and closest attention.

SOME DRUG ERUPTIONS.

HARTZELL, in the *Pennsylvania Medical Journal* for February, 1919, states that there is an extraordinarily wide variation both in individual susceptibility and in the frequency and character of these eruptions. Certain drugs, such as the salts of iodine and bromine, practically affect the skin of every individual to a greater or less degree; certain others, of which the hypnotics, more especially some of those more recently introduced, may be taken as examples, only occasionally and in certain subjects do so; while the members of a third group only rarely cause eruptions. Again in many instances the eruption follows a few doses or it may be only a single one; on the other hand it may appear only after a considerable quantity of the drug has been taken. As already observed, there is a wide diversity in the character of drug dermatoses. In the great majority of instances these are of an eruptive character and for the most part inflammatory and erythematous in type, but there are many exceptions to this rule. They may appear as hemorrhages, as alterations in pigmentation, as disturbances of the process of keratinization, and as sensory disturbances. While most of them are transient, disappearing with the withdrawal of the offending drug, others may persist for a considerable period or even indefinitely. Nor does the same drug always give rise to the same dermatosis, but its effect frequently varies greatly, principally according to individual peculiarity, but likewise according to the presence or absence of cer-

tain other elements, such as the presence of disease, functional or organic, of the circulatory or nervous systems or of the viscera.

As illustrating this variability reference may be made to the eruptions produced by the iodides. In practically every individual their administration is followed sooner or later by an acneform eruption, with which all are familiar, and which, therefore, needs no description; but in certain cases, fortunately rare, quite other and at times serious forms of eruption may be produced. Very exceptionally they produce a wide-spread purpuric eruption which, unlike the usual pustular one, disappears after some days even when the administration of the drug is continued. In rare cases a vesicular eruption accompanied by the most violent itching may follow even small doses, as in an elderly woman under his care some years ago. She was given moderate doses of potassium iodide, and after the third or fourth dose an abundant eruption of small vesicles appeared on the palms, to which it remained limited, associated with itching so severe that its administration had to be suspended; on its resumption a few days later the eruption promptly reappeared.

Equally rare and far more serious are the eruptions described by Sir Jonathan Hutchinson, Morrow, and Taylor. In Hutchinson's case large fungoid tumors, some of which ulcerated, were present on the face and trunk, while the cases of Morrow and Taylor were characterized by extensive and widely distributed bullæ. As the eruptions in some of the cases were regarded as syphilitic the iodide was given in increasing quantity and with the most serious consequences. It is worthy of note that in most of these cases the patients were the subjects of cardiac and renal disease, so that elimination was seriously impaired, and there is great probability that this contributed largely to the grave character assumed by the eruptions. It seems hardly necessary to point out the very great importance of being able to recognize the real nature of such cases, since the most disastrous consequences, even death, may follow the continuance of the drug.

In the great majority of instances the iodic eruptions are the result of the administration of the iodides of potassium and sodium, but similar effects may follow other iodides, such as the iodide of iron, which are not commonly thought of as possible causes of such eruptions. A few years ago Goodall exhibited before the Dermatological Section of the Royal Medical Society a case of iodide eruption resembling closely variola which had followed three doses of ferrous iodide. It should be noted that the patient was suffering from a chronic nephritis.

While these eruptions are almost without exception produced by the internal administration of some one of the iodides, they may in rare instances follow the external application of iodine; and Hodara has observed a generalized iodide acne follow three applications of tincture of iodine to the skin, which was afterward covered with an impervious covering.

Bromic acne is even more frequent than the iodic form. A few years ago when the bromides were so extensively employed in the treatment of epilepsy the most exaggerated cases were not at all infrequent, the eruption covering the face, back, and chest, producing great disfigurement. There is usually no difficulty in recognizing it, every one is familiar with the milder forms; but there is a less well-known type of bromic eruption, seen chiefly in children, characterized by large flat pustules seated on a granulomatous base which frequently coalesce to form plaques often of considerable size, seated on the face and extremities, less frequently on the trunk. Occasionally it is seen in nursing infants who are getting the bromide through the mother's milk. A remarkable example of this kind came under his observation a few years ago in a three-weeks old infant, who developed an extensive eruption shortly after birth, although it had taken no drugs; the mother, however, had taken a mixture containing a moderate amount of sodium bromide for some sort of itching affection up to the time of her confinement. Unless this possibility is kept in mind the source and nature of the eruption may escape recognition.

The bromides may produce ulcerative lesions resembling syphilitic rupia, a form of eruption to which the late Weir Mitchell called attention. These may at times resemble the syphilitic lesions so closely that even a skilled observer may be deceived, as Mitchell admits he was. Hartzell has seen but a single example of this variety, which occurred in an adult male who was in the habit of taking daily a considerable quantity of some proprietary mixture containing a bromide. There were a number of thickly crusted ulcers on the legs which bore a very close resemblance to the ulcers of tertiary syphilis.

PROGNOSIS OF CASES OF INTESTINAL PERFORATION IN TYPHOID FEVER WITHOUT OPERATION.

In the *Pennsylvania Medical Journal* for February, 1919, EISENHOWER admits it is only fair to say that a single physician's experience in perforation is not sufficient evidence from which to draw any valuable conclusion. Cordial assistance has been received by him from a great many physicians living in cities, boroughs, and rural districts where typhoid fever has prevailed at some time or other as an epidemic. The physicians from whom the information has been procured have treated over 14,000 cases of typhoid fever. It may be stated that a large number of physicians closely associated with surgeons and hospitals invariably state that in a very negligible percentage of cases of perforation do the patients recover without operation, while a number of equally capable physicians having connection with hospital work and a very large number of able physicians not doing institutional work have a more optimistic view of the possibilities of recovery without surgical measures.

In reply to a questionnaire which was sent to these physicians, most of them stated that they had treated over 100 cases of typhoid fever, some over 1000, and one over 1500. About 50 per cent of the physicians reported no perforations; of those who reported perforations, a large number had had able consultants who agreed in the diagnosis. The entire number of perforations reported was twenty-five; of this number seven of the patients recovered. There is no doubt that many more perforations occurred but were not recognized as such. Those reported were of a typical character, and some had evidence which could not be mistaken for anything else than perforation. A physician of considerable experience reported four cases of perforation; none of the patients had operations; three died. One recovered after suffering the classical symptoms of a local peritonitis; the patient was unconscious for three days, and then rallied. The local condition subsided, and in the course of three weeks the patient was able to be out of bed. For the seven days following the perforation a mass was detected on the right side of the abdomen.

Another physician and surgeon reported a case in which the bladder was ruptured, with a discharge of pus and fecal matter through the penis, and later a fistulous tract through the anterior abdominal wall over the bladder. The discharge continued for about two weeks. The fistula closed and the patient had a complete recovery. A case of perforation was reported with rupture in the rectum, through which the pus was discharged. This patient had a relapse and lived four weeks. An autopsy was made, which verified the diagnosis of perforation and the rupture into the rectum during the primary attack of typhoid fever.

One physician reported four cases of perforation with one recovery. Another reported four cases with 100 per cent deaths. One of his cases was diagnosed as acute appendicitis complicating typhoid fever. The abdomen was opened, but the appendix was found normal. A perforation sufficiently large to admit the index finger was discovered; the patient died six hours after the operation. The cases reported by other physicians were almost as interesting, but did not have the indisputable evidence of perforation as those to which reference has been made.

In conclusion, Eisenhower states that

none of the physicians answering the questionnaire had operations in any of their cases, except in the case which was mistaken for appendicitis. In some instances surgeons were called in, but, owing to the serious and hopeless condition of the patients, operations were not considered justifiable. There is a probability that if operations had been performed in the other cases the mortality would have been reduced. Again the writer wishes to emphasize the importance of an early operation in perforation. It is the universal method of treating such conditions, but if an operation cannot be had, do not give up all hope, for some cases recover.

PERTUSSIS VACCINE AS ROUTINE TREATMENT IN WHOOPING-COUGH.

LUTTINGER, in the *New York Medical Record* of February 22, 1919, concludes that pertussis vaccine, when put to the pragmatic test, in private practice, "works" to the satisfaction of the patient and the physician. When given in high doses and at the proper intervals it is the best remedy we have for the prevention and cure of whooping-cough, and one of the most valuable therapeutic agents we have in our armamentarium. The negative reports, so far published, are based on insufficient data and should not have been allowed to pass uncensored by the authorities. The widespread use of pertussis vaccine will solve the problem of whooping-cough, this *bête noire* of medicine which yearly kills 10,000 American children.

TONSILLECTOMY UNDER LOCAL ANESTHESIA.

JOBSON, in the *Pennsylvania Medical Journal* for February, 1919, states that after an experience of 325 cases of tonsillectomy operated on under local anesthesia (or, more properly, analgesia), he is convinced that it is the method of choice in most adult cases and a great many selective cases in children over twelve years of age.

The ages in the cases recorded ranged from eight to fifty-five years. The loss of blood was almost *nil*, the largest amount being not over two ounces, while in the majority of cases the operation was practically bloodless. In only one case was there delayed hemorrhage, which was brought about by forcible clearing of the throat an hour after the operation. In this case the hemorrhage, which came from the venous plexus at the base of the tongue, was readily controlled by compressing with gauze, impregnated with glycerite of tannin. In no case was there secondary hemorrhage. In 75 per cent of the cases the operation was painless; the remainder of the patients complained of slight pain during the momentary compression of the snare wire.

The "after-pain" was no more severe than that which follows a tonsillectomy under a general anesthetic; and convalescence was shorter than when a general anesthetic is used, as the shock consequent on the latter was absent.

The technique of the operation does not differ very materially from that followed by many operators, except in the method of injecting the anesthetic solution. The manner of injecting the solution is one of the principal factors in a bloodless and painless tonsil enucleation.

In preparation for the operation, a sufficiently thorough general examination should be made to assure knowledge of the functioning power of the heart, lungs, and kidneys; and to note the coagulating power of the blood. If coagulation time of the blood (seven and one-half minutes) be above normal, calcium lactate is administered in 15-grain doses three times a day for three days before the operation. Hemophilia should be ruled out, as far as possible, by the history. It is better not to remove the tonsils of women and young girls when menstruating, as they are more liable to bleed at that time. A tonsil that is acutely inflamed should not be operated on, or when there is any sore throat.

Half an hour before the operation a hypodermic of 1/6 grain of morphine and 1/150

grain of atropine is given. The atropine diminishes the amount of secretion in the throat and counteracts the effect of the cocaine, which is used in swabbing the throat.

The tonsils, pharynx, soft palate, and base of the tongue are painted with an 8-per-cent cocaine solution, at intervals of two or three minutes, for three or four applications.

The tongue is depressed with a Pynchon depressor in the hand of an assistant, care being taken that the base of the tongue on the side to be operated on is pressed downward and forward, by tilting the end of the depressor blade downward, and slightly toward the tonsil to be removed.

The tonsil is grasped very firmly at its upper and lower poles by forceps which will not loosen or tear out. For this purpose he has devised a modification of Tyding's forceps with saw-shaped teeth, set at an obtuse angle. These teeth are forced deeply into the tonsil, and engage the fibrous trabecula, thus giving a firm hold. The forceps have a strong locking device. Then, after being grasped securely, the tonsil is drawn firmly toward the median line, so as to raise the gland from its bed (fossa tonsillaris) and to render the faucial pillars taut. The space between tonsil and superior constrictor muscle, which is made by tension on the tonsil, is flooded with from one and a half to two drachms of a one-per-cent procaine (novocaine) solution or one of its substitutes, to which is added a few drops of 1:1000 adrenalin solution.

Caution should be used in the administration of too much adrenalin, for he is inclined to believe that some of the harmful results attributed to cocaine or its substitutes may be due to the action of adrenalin, when used in combination. The idea in flooding the tonsillar fossa is to force the superior constrictor muscle away from the tonsil; and with it the tonsillar, ascending and descending palatine arteries, which course along the outside of the muscle, before they supply numerous small twigs to the outside of the gland.

This hydraulic dissection not only lessens the danger of cutting large vessels, but many branches of nerves entering the tonsil are reached more effectually than by injecting at certain points. Again, the small arterial tonsillar branches, which pierce the superior constrictor, are blocked off by the adrenalin.

The technique of injection is to insert a long needle of a Pynchon, or other syringe, through the base of the taut anterior faucial pillar until the space behind the tonsil is encountered, when a portion of the solution is injected. The needle is withdrawn, and the operation is repeated at three points from the upper to the lower end of the anterior pillar. A few drops of solution should also be injected into the peritonsillar fossa at different points, to enhance anesthesia by blocking the nerve plexus known as the circulus tonsillaris. About ten minutes should be allowed for the action of the anesthetic, when the tonsil is grasped, as before, and drawn firmly toward the median line. The taut anterior pillar, with the plica triangularis bridging it to the tonsil, may be outlined. The plica is carefully separated by nicking it at the upper third of the tonsil with a Day angular tonsil knife; and with the flat surface hugging the tonsil, and cutting edge forward, the incision is prolonged into the anterior tonsillar fossa, and continued downward in this fossa to the inferior tonsil pole. The knife is reversed and the plica separated from the original incision to the posterior part of the supratonsillar fossa. Care should be taken not to cut into the anterior pillar or the tonsil. This is not difficult, if the tonsil is kept on the stretch when the knife is being used.

Cutting the anterior pillar would endanger the dorsalis lingual artery, and mutilation of the gland makes it difficult to do an intracapsular operation. If further separation of the tonsil is desired, a dull dissector, or back of the knife, may be used after separation of the plica. On no account should separation of the posterior pillar (which contains a branch of the ascending pharyngeal artery and a large vein) with a

knife or dissector be attempted, as the snare will peel the tonsil from the posterior pillar without danger to its vessels better than by dissection.

The tonsil having been freed from its supratonsillar and anterior pillar connections, a number eight snare wire is slipped over the locked forceps and pulled down to a size that the tonsil will about fill. This loop is insinuated back of the tonsil, with cannula at the anterior and upper third of the gland, and with quick pressure the tonsil is enucleated, and drops out in the grasp of the locked forceps. The fossa tonsillaris is swabbed with glycerite of tannin to further seal the vessel mouths. The patient is returned to his room, propped up in bed at an angle of 45 degrees, and given pellets of ice to dissolve in the mouth for the relief of the after-pain.

NITROUS OXIDE ANALGESIA IN LABOR.

COBURN, in the *New York State Journal of Medicine* for February, 1919, states that nitrous oxide analgesia should be instituted as soon as the contractions produce a decided pain, which is usually about the end of the first stage, placing the emphasis on the pain rather than on the stage. Intelligent patients will request it at the proper time.

First of all there must be an apparatus of some kind with which to administer nitrous oxide, and here is where the trouble begins. To paraphrase: as many anesthetists of many minds, as many apparatus of many kinds. This is so because, to administer nitrous oxide to the best advantage, a more or less complicated apparatus and outfit of cylinders are required, and yet it can be administered with a very simple apparatus and a single cylinder. Some of the more complicated forms of apparatus have been designed more especially for the requirements of general surgery, where there is a prolonged administration, and so they are not adapted to the short, intermittent administrations for obstetrical analgesia; others are not adapted for self-administration; some are too large and heavy, others are too expensive. The circumstances under which they are used likewise vary greatly; some are wanted for use in hospitals, others for the bedside, some for self-administration, others for an anesthetist. All of these and yet other factors enter into the selection of appropriate apparatus. Finally, the kind of apparatus, and how and where used, enter into the technique of administration, so only the fundamental principles involved can be here considered.

The patient should be instructed how to coöperate. Upon the first indication of the contraction, announced either by the patient or detected by palpating the abdomen, the mask should be quickly applied and the patient take three deep and rapid inhalations of nitrous oxide, and at the end of the third inhalation hold her breath as long as possible and "bear down." This usually furnishes analgesia for a complete contraction.

It is quite essential that the patient hold her breath as long as possible, so that a sufficiency of nitrous oxide be absorbed, and not immediately exhaled. The "bearing down" not only augments the expulsive effort, but also increases the rapidity of the absorption of nitrous oxide.

The number of the inhalations of nitrous oxide is important, and should be regulated according to the requirements, no more being administered than is required to produce analgesia. After the required number of inhalations are taken the administration of nitrous oxide should be discontinued until the incipiency of the next contraction, when the same process is repeated.

The tendency is to give too many inhalations. Two deep inhalations, the last one held as long as possible, give quite a degree of analgesia with the average patient, and four such inhalations a pronounced analgesia. Coburn says: "Try it on yourself, and be convinced. You can then talk more emphatically and convincingly to your patients."

He prefers to remove the mask at the end of the periodic administrations, as patients

appear to hold the breath longer when the analgesic is withdrawn; others recommend leaving the mask in position, shutting off the nitrous oxide and allowing the patient to inhale air until the contraction subsides, and then removing the mask.

Likewise there is a difference as to the type of inhaler employed. He prefers the face inhaler; some others recommend a nasal inhaler.

It is emphasized that the administration of nitrous oxide should be begun just as soon as there is an indication of the contraction, so that analgesia will be established before pain develops. It takes less of the analgesic to prevent pain than it does to abolish it. The "first on the job" has the advantage. This throughout is a race and a contest between the analgesia and the contraction. On the other hand, the analgesia must not be established too soon, else the analgesia will subside and pain will be experienced toward the end of the contraction, especially when the contractions have a slow onset.

Either an attendant or the patient may place the mask in position, and remove it at the end of the required number of inhalations, or loosen the spring that shuts off the gas, but of course nitrous oxide must be supplied to the bag. The McKesson and the Clark apparatus have automatic means for keeping the bags filled, and for preventing waste when the patient is not inhaling, and so are well adapted for self-administration. A dental face mask, cylinder yoke, bag, tubing, and a cylinder of gas constitute the simplest outfit for administering nitrous oxide. Such an outfit is light and compact, can be carried anywhere, is inexpensive, and adapted for self-administration, provided some one keeps the bag properly filled with nitrous oxide. In the absence of a nurse, any adult that may be allowed in the room may be quickly instructed how to perform efficiently this very light task.

Self-administration is a psychological aid, as it directs the patient's mind to extraneous matters. Of course, there should be some oversight by a competent observer with self-administration, though this is the one form of administration where nature protects the patient from most all of the danger by relaxing the hand that holds the mask against the face as soon as anesthesia is established.

APOTHESINE OR COCAINE?

The *Memphis Medical Monthly* of October 1, 1918, states that there are many indications that apothesine is gradually superseding cocaine as a local anesthetic. This is not said in depreciation of the last mentioned drug, the merits of which are well understood. It must be remembered, however, that cocaine possesses some grave defects. Prominent among these is its toxicity. Furthermore, unrestricted use of the product leads ultimately to the formation of the cocaine habit. Apothesine, which is as efficient as cocaine, has been shown by comparative tests to be far less toxic than the latter. Moreover, it is not subject to the narcotic law, and its use does not eventuate in habit formation. Apothesine produces such complete anesthesia that even major operations are performed under its influence quite as successfully as under cocaine, a fact that further emphasizes the importance of its discovery.

THE COMPARATIVE VALUE OF THYMOL AND CHENOPODIUM IN THE TREATMENT OF UNCINARIASIS.

BERCOVITZ, in the *China Medical Journal* for January, 1919, states that a glance at his tables shows at once the superiority of chenopodium as far as effectiveness is concerned. There is over 40 per cent difference between the two drugs in favor of chenopodium in the case of the girls, and about 20 per cent difference in favor of chenopodium in the case of the boys; with a difference of over 25 per cent in favor of chenopodium if all cases are grouped together.

Better results would be obtained, no doubt, with massive doses of thymol. In strictly hospital practice this could be done, and doses of 90 to 120 grains would give

cures in practically 100 per cent of the cases. Darling reports such a result with massive doses. For general field work, however, and especially in extensive work in China, where the conditions cannot be controlled with any degree of certainty, a safer drug must be sought.

The experience with oil of chenopodium in Kachek has been very favorable. For the second treatment no dietary regulations were observed except the omission of breakfast on the morning of the treatment. In no case was any ill effect noted. The patients even refused to lie down after treatment. The maximum dose used was thirty-six minims, but this can easily be raised to forty-five minims with safety.

The ease with which oil of chenopodium is administered is a strong point in its favor. Not only is time consumed in the preparation of thymol capsules, but the patients do not enjoy swallowing several large (gr. v) capsules. It has been the experience in Kachek that oil of chenopodium in simple syrup was preferred by all who took the chenopodium, and was asked for by a number who were taking the thymol. In an extensive campaign this must be taken into consideration.

Not least important is the fact that chenopodium is an energetic agent for expelling not only hookworm but also roundworms. Experiments have not been undertaken as yet to determine which of the two drugs, santonin or oil of chenopodium, is the more effective against the ascaris, but it is believed that little if any difference can be noted between the two. Hence, in view of the almost universal infection with *Ascaris lumbricoides,* and the attendant discomfort and abdominal pain which so frequently accompany their presence in the intestines, the oil of chenopodium performs a very useful function in addition to its anti-hookworm properties.

Thymol has served long and well as the specific for hookworm. There are four weighty reasons, however, why the newer drug must take its place:

1. It is more effective in the treatment of hookworm than thymol, a difference of more than 25 per cent being noted in its favor.

2. It is a safer drug than thymol, a fact of the greatest importance in dealing with conditions in China.

3. It is easy of administration, being economical in time, as well as more pleasant to the patient.

4. In addition, oil of chenopodium is effective as a vermifuge for *Ascaris lumbricoides,* and thus two infections are cured by one remedy.

In conclusion, one point must be noted against chenopodium. At least ten days or two weeks should elapse before a reëxamination of the feces is made. It would seem, however, that in an extended and thorough campaign the work would naturally be rather slow, especially if accompanied by an educational campaign in sanitation, and so this factor is not so very important.

THE ADRENALIN TEST FOR THYROID DISORDERS.

Endocrinology: The Bulletin of the Association for the Study of Internal Secretions, October-December, 1918, reminds us that Goetsch attempted to determine whether there would not be an increased sensitiveness to adrenalin in all cases manifesting symptoms of "hyperthyroidism." He began by using a hypodermic dose of 0.00075 gm., or 10 minims (1:1000 sol.), observing the effect upon the pulse, blood-pressure and the constitutional reaction over a period of one and a half hours. In all cases of "hyperthyroidism," whether mild or marked, a positive reaction was obtained. Later he found that this dose would occasionally produce a slight reaction in what one would regard as possibly a normal individual. Consequently 0.0005-gm. doses (0.5 Cc. of 1:1000 sol.) were later used, an amount which is insufficient to cause any but the very slightest increase, less than 10 in fact, in blood-pressure or pulse and practically no subjective symptoms whatever. This

dose was then used as the standard. If thyroid secretion sensitizes the sympathetic endings to the action of adrenalin, then it is reasonable to suppose that a sudden increase of adrenalin in the circulating blood should call forth active responses throughout the domain of distribution of the sympathetic system.

This result was found to be remarkably constant. Not only does a "hyperthyroid" patient react constitutionally to a subcutaneous dose, but also locally to an intradermic dose of one minim of 1:4000 solution of adrenalin. This latter reaction depends upon the excessive contraction of the smooth muscle in the small vessels of the skin supplied by the sympathetic, and is characterized by a central large area of blanching surrounded by a peripheral zone of reddening due to neighboring secondary vasodilatation. In the blanched area a characteristic "goose-flesh" is often seen. The reaction in a thyroid patient (exophthalmic goitre or toxic adenoma) lasts for 1½ to 2¼ hours as compared with one-half to three-quarters of an hour in the normal subject. Whether the reaction will be found in other than thyroid cases has not yet been determined.

In addition to the local reaction the systemic response may also be used as a criterion of sensitiveness. A hypodermic injection of 0.5 Cc. (1:1000) solution of adrenalin is administered. In a positive reaction there is usually an early rise in blood-pressure and pulse of over 10 points, and at times of 50 points or more. In a half-hour there is a moderate fall followed by a secondary rise and fall, normal being reached in about 1½ hours. In addition various symptoms of Graves's disease may be produced or augmented, not however, in Goetsch's experience, to a dangerous degree.

The following may all or in part be found: increased tremor, apprehension, throbbing, asthenia, and in fact an increase in any of the symptoms of which the patient may have complained. Vasomotor changes may be present, namely, an early pallor of the face, lips, and fingers, due to vasoconstriction, to be followed in fifteen to thirty minutes by a stage of vasodilatation with flushing and sweating. There may be a slight rise of temperature and a slight diuresis.

In order to interpret a test as positive it is regarded as necessary to have a majority of these signs and symptoms definitely brought out or increased. Thus there is at times a considerable increase of pulse rate without much increase in systolic blood-pressure, but with a considerable increase or exacerbation of the objective signs and symptoms; or there may be an increase of ten points in the pulse and blood-pressure and a moderate increase of the symptoms and signs; or, again, there may be only slight changes in pulse and blood-pressure and considerable change in signs and symptoms. These may be regarded as positive. In a word, then, one must consider the entire clinical picture produced in order to gain a correct interpretation, just as in the disease itself one cannot expect every one of the characteristic signs and symptoms to be present in order to make a diagnosis.

A considerable degree of correspondence between the severity of the disease, clinically, and the reaction has been noted. After thyroidectomy, either in cases of exophthalmic goitre or of adenoma, the sensitiveness to adrenalin is materially reduced, if not entirely removed. After excision of adenomata the sensitiveness disappears quite early because here the entire offending tissue is removed. In the case of exophthalmic goitre, however, a certain degree of sensitiveness may persist because one cannot with safety remove the entire thyroid gland.

The test has been of the greatest value and help in the diagnosis of that large group of border-line cases resembling in some respects Graves's disease, but without definite recognizable signs on the part of the patient generally or in the findings of the thyroid gland, which may not be palpably enlarged. Many of these cases have proved to be dependent upon the adenomatosis of the thyroid gland discovered at operation,

which was advised previously on the basis of the positive adrenalin test. Many small adenomata were found, however—too small to be palpated before operation. In this manner the uncertainties in diagnosis are produced by the disease. That the diagnosis in these cases is correct is shown by the histological evidence of functional activity in these adenomata and by the fact that a practically complete cure is accomplished by removal of the adenomatous tissue. The reaction has been of particular value in picking out thyroid cases from that large group of ill-defined conditions designated as psychoneurosis, psychasthenia, and neurasthenia. In several instances of this kind in which mental symptoms predominated, and in which the examination failed to reveal any positive signs in the eye, thyroid gland, or heart, there was found a mildly positive adrenalin reaction, and at operation multiple small adenomata were found in the thyroid gland.

THE TREATMENT OF WOUND SHOCK.

The publication in full of Professor Bayliss's lectures on the treatment of wound shock serves as a reminder of the part played in the war by the science of physiology. In all phases of the common activity of the nation evoked by this supreme struggle, the solution of difficulties and the adaptation necessary to insure success have commonly been provided, in the first place, not by the so-called practical man, but by the laboratory worker. It is true that the accusation of scientific aloofness, which in the past has frequently been brought against physiology in England, has been due in the main to a failure to appreciate the constant and growing influence exercised on the practice of medicine by every addition to our knowledge of the normal workings of the healthy body. It is true also that the part played by physiology in the war is still too scantily recognized, though it has ranged from the preservation of the aviator to the regulation of food, from gas defense and treatment of gas poisoning to the prevention of scurvy among the troops. The researches, of which an account is given in the volume entitled "Intravenous Injection in Wound Shock," carried out by the most learned physiologist of the day, and belonging to a subject hardly mentioned in the text-books of ten years ago, have at last not only thrown light on the long-disputed nature and causation of wound shock, but have placed in the surgeon's hands an effective method of treatment and prevention.

An abstract, obligingly furnished by the author himself, of the two lectures given under the Oliver-Sharpey foundation, before the Royal College of Physicians, in May, 1918, was published in the *British Medical Journal*. Bayliss gives the substance of the lectures at greater length and includes some further evidence as to the nature of shock, derived from experiments performed subsequent to their delivery. Professor Bayliss deals in the first place with the relation of shock to hemorrhage. He shows that in shock, as in hemorrhage, the essential feature is a deficiency of blood in circulation. In most cases, in fact, shock is complicated with hemorrhage of more or less gravity, but in every case the treatment is the same—namely, the restoration so far as possible of the volume of the circulating fluid, so that the circulation may be maintained and the supply of oxygen to the tissues kept up.

Since every rational therapeutic measure must depend on the knowledge of the causation of the condition which it is desired to ameliorate, the author has to discuss the essential nature of wound shock. He shows that dilatation of the vessels or vasomotor paralysis is not an essential feature, and that acidosis or diminution of the alkaline reserve of the blood, which is almost invariably present in the later stages of shock, is more of the nature of a result than a cause, and is due to the starvation of the tissues in oxygen consequent on the augmenting failure of the vascular supply. He concludes that in the absence of hemorrhage the fall of blood-pressure and the diminution of the fluid in circulation must be due to a general capillary dilatation and to the

loss of blood from the circulation by stagnation in this part of the system. He adduces certain facts which appear to indicate that this capillary dilatation is toxic in origin, and is due, perhaps, among other factors, to the absorption of chemical substances produced in damaged muscle. Dale has shown that a condition indistinguishable from wound shock can be produced by the injection of histamine, and that the salient feature of the action of this drug is a dilatation of the capillaries, which may be combined with constriction of the arterioles. Whether the substance absorbed from the injured tissues is histamine itself, or some other body presenting similar physiological properties, has not yet been definitely established.

The essential feature of shock being the loss of fluid from the circulation, the obvious method of treatment would be the introduction of fluid to make good this loss. Salt solutions, isotonic or hypertonic, are useless for this purpose, since they escape through the capillary walls almost as rapidly as they are injected. Alkaline salt solutions are equally ineffective, and may, in fact, be harmful. Human blood may, of course, be used, and has been used to a large extent in France, provided that a giver is at hand and that it is possible to take all the precautions necessary for the transfusion of blood from arm to arm, or the injection of blood preserved by citration and exposure to cold. Professor Bayliss shows that these complications are unnecessary, since equally good results can be obtained by the injection of an artificial serum, which can be prepared and maintained sterile in any quantity. Salt solution escapes from the vascular system owing to its deficiency in protein, so that it has neither the viscosity of serum nor the osmotic pressure due to the protein which serves to keep the water of the blood within the vessels. It was necessary, therefore, to find some substance or substances which, added to salt solution, will confer on this fluid a viscosity and a colloidal osmotic pressure equal to that of blood or blood serum. These requirements, Bayliss shows, are met by two substances, namely, gelatin and gum arabic. Gelatin presents the disadvantages that it may contain tetanus spores, that it tends to be altered by effective sterilization, and that it may promote intravascular clotting. None of these disadvantages are possessed by gum arabic. A solution of gum arabic of 6 or 7 per cent in 0.9 sodium chloride has the viscosity of blood and the osmotic pressure of its colloids. Gum arabic is quite innocuous both in animals and in man. It is easily sterilized without loss of viscosity, and its repeated injection does not give rise to anaphylactic phenomena. It does not hemolyze or agglutinate human blood. The gum salt solution, previously sterilized and filtered, can be preserved in well-closed bottles which can be used even in the advanced dressing stations.

When a patient shows signs of shock with the customary lowering of blood-pressure, Professor Bayliss recommends that this gum salt solution be injected in quantities sufficient to raise the blood-pressure to a normal level. A certain number of illustrative cases are quoted in the lectures showing the excellent results obtained by this procedure. Many patients were saved who without the injection would certainly have died of the original injury or of the necessary subsequent operation. — *British Medical Journal,* Feb. 8, 1919.

FOOD AND ITS RELATION TO HEALTH.

CLARK, in the *New York State Journal of Medicine* for February, 1919, states that it is quite surprising to learn how by instinct the ordinary portions of food served are made to correspond to approximately 100 calories. The following quotations from Fisher and Fisk serve to illustrate this fact:

"It will help to give a picture of food values if, before going further, we note how much it takes of some of the common foods to make a given amount of food value, say 100 calories. We find 100 calories in a small lamb chop, weighing about an ounce; in a large egg, about 2 ounces;

in a small side-dish of baked beans, about 3 ounces; in 1½ cubic inches of cheese, about an ounce; in an ordinary side-dish of sweet corn, about 3½ ounces; in one large-sized potato, if baked, about 3 ounces; if boiled, about 4 ounces; in an ordinary thick slice of bread, about 1½ ounces; in one shredded wheat biscuit, about an ounce; in a very small piece of sponge cake, about an ounce; in a third of an ordinary piece of pie, about 1½ ounces; in three teaspoonfuls or 1½ lumps of sugar, about 1 ounce; in a dozen peanuts, about ⅔ of an ounce; in eight pecans, about ½ ounce; in four prunes, about 1 ounce; in two apples, about 7 ounces; in a large banana, about 4 ounces; in half a cantaloupe, about 9 ounces; in seven olives, about 1½ ounces; in a very large orange, about 10 ounces; in an ordinary pat of butter, about ½ an ounce; in a quarter of a glass of cream, about 2 ounces; in a small glass of milk, about 5 ounces."

As intimated above, not all of our food can be regarded as fuel food proper. Fats, and carbohydrates, such as sugars and starches, consisting as they do of carbon and hydrogen, are the principal combustible foods; hence these are the foods which give us heat and energy. The protein or nitrogenous foods, like meat, milk, eggs, fish, cheese, dried beans, or dried peas, are the foods that are used principally to furnish the building and repair material for the body. To use a familiar illustration, we can compare the protein foods we eat to the oil which is used in the automobile. The purpose of the oil in the automobile is to keep the machine in good running order. We can compare the carbohydrate foods which we eat to the gasoline in the automobile; the combustion of the gasoline in the automobile drives the machine, just as the combustion of the carbohydrate foods in the human body gives it energy to enable it to do the work that it is called upon to perform. The different kinds of food, to a certain extent, can do each other's work; thus some protein foods can, under certain conditions, be burned in the body and do the work of the carbohydrates. While some of the proteins, as stated above, can take the place in the body and do the work of the carbohydrates, the latter, however, cannot take the place of what are called albuminoid proteins in the process of building up new tissues and repairing worn and wasted ones.

As a result of a large amount of experimentation, the conclusion seems to be pretty firmly established that a well-balanced diet furnishing a total of from 2500 to 4500 calories of food value of different kinds is sufficient for all the daily food needs of the average man or woman taken, of course, with reference to age, size, occupation, and physical peculiarities.

A SIMPLE METHOD OF FORMULA WRITING.

Hoobler, in *The Leucocyte* for December, 1918, points out that a cow's milk formula, even though it may be poorly constructed, is preferable to using the proprietary foods with very elaborate and scientific directions, since from experience in hospital wards and in private practice it has been found to be much more easy to correct a nutritional disorder developed while on a fresh cow's milk formula, than one developed while the infant was being fed one of the proprietary preparations. Before one can think of writing a formula certain necessary information must be obtained. The following questions will elicit the minimum amount of information on which to build a formula, but the most minute details of the infant feeding history will better enable one to outline a proper formula:

1. Does the baby vomit?
2. Is there constipation or diarrhea?
3. How much does the baby weigh?
4. How old is the baby?
5. Is the baby troubled with flatulence?

There are a few facts which one can obtain only by physical examination; the minimum of such information is covered by the following observations:

1. Is the anterior fontanelle sunken or normal?
2. Is the abdomen distended?
3. Are the buttocks excoriated?

4. Does the baby look pale and pasty?

5. Is the muscle of the thigh soft and flabby?

There are a great many other points which a careful physical examination will reveal, all of which are of extreme value in determining the present condition of the child's nutrition, of its water content and the grade of malnutrition, but one cannot possibly hope to construct an adequate formula unless one knows the conditions as revealed in the ten points mentioned.

Armed therefore with at least the minimum of information obtained from the above history and physical examination, one is able to proceed with the construction of the formula.

Three ingredients are present in practically every formula written and form the framework for the structure. These ingredients are milk, water, and sugar; and these words should be written down directly under one another thus:

Space 1—	Milk	Space 4—
Space 2—	Water	Space 5—
Space 3—	Sugar	Space 6—

Since there are many kinds of milk—*i.e.*, whole, top, or skimmed—and many varieties of water, such as barley, oatmeal, plain boiled, and likewise many forms of sugar—*e.g.*, granulated, lactose, dextri-maltose, and maltose—it is evident that before each of these three words there must be written some qualifying words in spaces 1, 2, and 3 in order to direct what sort of milk, water or sugar one is to use.

SUGGESTIONS FOR FILLING IN SPACE 1.

Hoobler has arranged in a column marked "Space 1 ingredients" various forms of cow's milk which may be used in a formula as follows:

"Space 1 ingredients" various forms of
Whole milk 3, 5% fat.
Top milk: top half of bottle, 7% fat.
top 20 oz., 6% fat.
top 24 oz., 5% fat.
Skimmed milk, 1.5% fat.
Fat-free milk 0, 5% fat (milk passed through cream separator).
Fat-free buttermilk 0, 5% fat.

With the above Space 1 ingredients in mind let us decide on the one which we wish to use. In the large majority of cases whole milk will be found to be entirely satisfactory. Top milk of various strengths named may be used advantageously for infants under one month; skimmed or fat-free for vomiting babies, buttermilk for distended babies.

He constructs a formula for a normal three-months-old baby weighing 12 pounds, not vomiting and having normal stools.

Since all the ingredients named have relatively the same protein content he has noted only the fat content, which one observes varies widely, so that the choice of the form of milk used will determine the relative amount of fat fed the infant—*e.g.*, if top milk is used the proportion will be greater than if whole milk were used. Most infants will digest a moderate amount of fat, a few will digest very large quantities, and some will digest a very small amount. It is wise, therefore, to start with a moderate amount as represented in whole milk and work up or down as the chief clinical evidence of fat indigestion appears, viz., vomiting, with a rancid odor to vomitus.

Therefore, if we choose milk our formula will be advanced thus:

Whole	milk	Space 4—
Space 2—	water	Space 5—
Space 3—	sugar	Space 6—

SUGGESTIONS FOR FILLING IN SPACE 2.

Our next step is to fill in Space 2. A list of the different cereal waters used in diluting cow's milk is given under heading "Space 2 ingredients."

Space 2 ingredients—
Barley water (no action).
Oatmeal water (laxative).
Rice water (constipating).
Wheat-flour water (constipating).
Corn-flour water (no action).
Boiled water (no action).

He has noted after each cereal water the effect of such cereal on the infant stools. If the baby were constipated he would use a laxative cereal water, viz., oatmeal water. If the baby, on the other hand, were having too many stools, *i.e.*, five or more daily, he would use a constipating cereal water, *e.g.*, rice water. If normal stools, then he would use one of the cereals which had no specific effect, *e.g.*, barley water. Thus in this par-

ticular formula we are writing we would fill in Space 2 thus:

Whole	milk	Space 4—
Barley	water	Spabe 5—
Space 3—	sugar	Space 6—

SUGGESTIONS FOR FILLING IN SPACE 3.

The filling in of Space 3 will determine the kind of sugar fed for the infant. There have been many forms of sugars developed in recent years in the attempt to find a product which (*a*) could be fed to babies having loose stools, and (*b*) which would counteract the tendency to constipation in artificially fed infants. He lists a few of them as follows:

Space 3 Ingredients.

Milk sugar.
Granulated sugar.
Dextri-maltose No. 1.
Dextri-maltose No. 3 (laxative).
Borcherdts Dri malt soup with pot. carbonate (very laxative).
Borcherdts Baby sugar (very laxative).

Sugars from their very nature are all laxative, some more than others, depending on their maltose content. Therefore, in diarrhea sugars are diminished or taken away entirely, while in constipation they are increased, and those containing large percentages of maltose are used. An infant with normal stools should be fed on one of the sugars which is slightly laxative, as, for example, milk sugar or granulated sugar. On filling in Space 3 we would write the words milk or granulated, whichever is available, and our formula would then read:

Whole	milk	Space 4—
Barley	water	Space 5—
Milk	sugar	Space 6—

It is evident now that only spaces 4, 5, and 6 need be filled out to have the formula completed. As the clinical condition of the gastrointestinal tract influences one in filling out the spaces determining the kinds of foods, so age and weight and the condition of fontanelle influence one in deciding amount of the different ingredients.

SUGGESTIONS FOR FILLING IN SPACE 4.

The weight of the child decides in general the quantity of milk used. The general rule is to use from 1 to 2 ounces of milk per pound of weight of child—the younger the child, the less milk per pound of child. Since the infant for whom we are writing the formula weighs 12 pounds, the formula would be further constructed as follows:

Whole	milk	12 ounces
Barley	water	Space 5—
Milk	sugar	Space 6—

SUGGESTIONS FOR FILLING IN SPACE 5.

Space 5 should next be filled in. The filling of this space determines the total quantity of fluid the infant is to get in its bottles. The *minimum* fluid need is roughly estimated at one-sixth of the body weight; thus, 12 pounds, 192 ounces; 1/6 of 192=32; hence, 32 ounces is the minimum fluid for a 12-pound normal infant to get. Additional fluid is supplied by giving water between feedings.

The formula now stands:

Whole	milk	12 ounces
Barley	water	20 ounces
Milk	sugar	Space 6—

SUGGESTIONS FOR FILLING IN SPACE 6.

Space 6 now remains to be filled. Generally speaking, one may add 5 per cent sugar to the average formula. This may be done by adding one-quarter of an ounce by weight of any sugar to each 5 ounces in the formula. The formula having 32 ounces, there should be added six quarter-ounces of sugar, or 1½ ounces, by weight. Hence the completed formula would read:

Whole	milk	12 ounces
Barley	water	20 ounces
Milk	sugar	1½ ounces

The directions for feeding must now be added. The generally accepted view is that in cow's milk feeding the minimum time between feedings should be three hours (7 feedings in 24 hours as follows: 6 A.M., 9 A.M., 12 noon, 3 P.M., 6 P.M., 12 midnight, and 2 A.M.), and not longer apart than every four hours (5 feedings in 24 hours, as follows: 6 A.M., 10 A.M., 2 P.M., 6 P.M., 10 P.M). A child below three months at least 7 feedings in 24 hours. A child between three and six months at least 6 feedings in 24 hours. A child above six months at least 5 feedings in 24 hours.

Thus the directions for the formula we have developed would read: Divide equally

into 7 bottles and feed at 6-9-12-3-6-10-2 A.M.

Now take for example the same child who instead of having normal stools was very constipated, but normal in every other way. Based on the above, one would write a formula chosen from ingredients marked "laxative" as follows:

Whole	milk	12 ounces
Oatmeal	water	20 ounces
Dextri	maltose	No. 3—1½ ounces

The same directions for feeding would apply as in the previous formula.

Suppose the child had been having five or more green, slimy diarrheal stools daily; the formula would then be chosen from ingredients noted as "constipating":

Skimmed milk	12 ounces
Rice water	20 ounces
Dextri-maltose	No. 1—1 ounce

(Note reduction in sugar.)

with same directions for feeding as in previous formulas.

This indicates in a most general way how to construct formulas for infants with normal, constipated, and diarrheal stools. A few further suggestions based on history and physical examination may be made.

If the baby is vomiting, feed on milk low in fat (Space 1).

If the baby is distended and has much gas, cut down sugar (Space 6).

If the buttocks are excoriated, reduce first fats (Space 1) and later sugars (Space 6).

If the fontanelle is sunken, increase fluids (Space 5).

If the muscles are flabby, increase protein (Space 4).

If the child is pasty and edematous, diminish carbohydrates gradually (Space 6), increasing fat and protein (Spaces 1 and 3).

These formulas, when figured on basis of calories, will be found to supply the caloric need of the infant and at the same time will furnish a properly balanced ration for the growing infant.

Any formula arrived at by the above method is but a trial formula and may or may not agree. The closer the child is to normal the more apt it is to agree, and conversely, the more deranged its nutrition, the less apt it is to agree.

This article was not written with the idea of giving help in feeding very sick infants, but rather to help the general practitioner feed the great number of normal infants which are under his charge.

Summary: In filling out the spaces before and after the words "milk," "water," and "sugar," one determines the amount and character of the nutrition as well as the action on the intestinal tract.

Space 1 determines the quantity of fat in the formula.

Spaces 2 and 3 determine the laxative or constipative character of the formula.

Space 4 determines the quantity of protein to be fed.

Space 5 determines the quantity of fluid to be fed.

Space 6 determines the quantity of carbohydrate fed.

THE COURSE OF LABOR IN BREECH PRESENTATIONS, WITH SPECIAL REFERENCE TO THE PREVENTION OF COMPLICATIONS.

HARPER, in the *New York State Journal of Medicine* for February, 1919, states that granted the case is one in which haste in delivery is not imperative, the conduct of the second stage may be summarized as follows: In response to propulsive uterine contractions, the frequency of which may be increased by persistent gentle massage of the fundus and the intensity of which should be augmented by firm downward fundal pressure exerted by the hands of an assistant, the breech gradually distends the perineum and is born. The feet may be lifted out of the vulvovaginal opening, which on occasion retards their advance. Anterior rotation commonly is incomplete and the buttocks as frequently are born in, or approximately in, an oblique diameter. Subsequent expulsive efforts are to be awaited and the temptation to exert traction resisted. Since the arms are to descend in an oblique diameter, no attempt should be

made to rotate the back to the front. The danger from pressure on the cord at this time is slight; however, it should be anticipated and the fetal heart frequently auscultated. With the next contraction the navel commonly is born.

At this point it is imperative, with each contraction, that fundal pressure be increased, for the cephalic extremity is leaving the active upper and entering the less active lower segment. As advance is accomplished the child's body is raised and two fingers, inserted beneath it, are directed upward to meet and pull down first the elbow of the flexed posterior and then of the anterior arm. It is at this point that firm traction too frequently is employed. Following the expulsive efforts resulting in birth of the shoulders, the uterus temporarily is inactive, and tractile force alone necessary to deliver the after-coming head would have to be correspondingly increased. Such force, applied about the child's neck and over its shoulders, entails the danger of injury to nerve trunks and subsequent paralysis, as well as that of extensive perineal laceration due to rapid advance and delivery of the head. Rather, the child's body is raised obliquely over the maternal abdomen, and the final expulsive effort of the uterus awaited. The body is raised obliquely that the anatomical relation between it and the after-coming head, which is to advance in an oblique or possibly in the transverse diameter of the inlet, may be preserved; it is placed over the maternal abdomen that it may be momentarily extended upon the head, which is to undergo progressive flexion (as the occiput is retarded by the symphysis), to follow the curve of the pelvic cavity, and to leave the vulvovaginal outlet directed forward and upward.

Firm, intermittent, suprapubic pressure is the most available and satisfactory force to supplement the feeble uterine expulsive efforts at this point, and traction on the shoulders, though efficient, is unsatisfactory because of the difficulty in securing the rapidly changing direction of pull that is imperative if the head actually is to follow the curve of the pelvic canal. When spontaneous or artificial expulsive efforts are insufficient to produce advance, the head may be brought into the mid-pelvis by means of forceps. Further advance and at the same time accommodation to the pelvic curve may be secured by firm pressure from above and moderate traction exerted by the finger in the child's mouth. In this manner the face can be brought to the vulvovaginal outlet or to such a point that depression of the perineum by means of a posterior vaginal retractor will permit of the entrance of air to the mouth. At this time the largest diameters have yet to be delivered, but, since the dangers of intra-uterine asphyxia now are *nil*, reasonable time may be spent in securing the gradual dilatation of the outlet necessary to permit of the passage of them without perineal injury.

The foregoing is neither a consideration of all the complications associated with delivery by breech nor of the various methods to be employed in the operative treatment of them. It is conceded that many cases present serious difficulties even when physiological forces have been perfectly utilized and when no disproportion exists. But it is insisted that the majority of the difficult deliveries may be placed in one of two classes: (1) those due to relative or absolute disproportion, in which expectancy is contraindicated; and (2) those in which physiological forces either were nullified or were replaced by those wholly unphysiological.

POISONING FROM BISMUTH SUBNITRATE PASTE.

The *New York Medical Journal* of March 29, 1919, states that although the therapeutic results obtained by the use of Beck's bismuth paste are unquestionably very satisfactory, the procedure is not devoid of danger. There are a number of surgeons who maintain that iodoform ether, iodoform oil, or camphorated naphthol are quite as satisfactory in the cases which are suitable for bismuth paste. They likewise point out

that bismuth intoxication may occur and that before resorting to its use the condition of the liver and kidneys must be carefully ascertained. It is an undoubted fact that all the toxic accidents produced by bismuth subnitrate are due to the transformation of insoluble salts into soluble ones, this transformation resulting from the action of the liquids of the organism and from the absorption of the newly-formed salts thus produced. Dalché has pointed out that the presence of albuminoid matter favors the solubility of the metallic oxide, and, absorption continuing, the toxicity of the bismuth subnitrate is explained.

Bismuth subnitrate should not be used as a dusting powder for extensive wound surfaces on account of the toxic accidents which have been reported, while the use of Beck's paste, regardless of the successful results obtained, must be carefully watched and the possibility of poisoning guarded against. The preventive measures consist, in the first place, in not injecting large quantities of the paste and in attentively watching for the very first symptoms of intoxication, in order to remove at once the mass of unabsorbed bismuth. To accomplish this, the fistulous tract or cavity need only be syringed out with sterile oil and then filled with the oil for about twenty-four hours in order to make an emulsion which can be removed by aspiration. The removal of the paste with the curette is a dangerous procedure because it opens the door to further absorption. However, when the paste has been eliminated the symptoms of poisoning quickly fade away, and one should not place too much importance on the appearance of a mild cyanotic tint of the gums, as this symptom has been noted by the Becks in some twenty per cent of the cases, and none of the patients offered any other evidence of intoxication than this. On the contrary, these cases have given the best therapeutic results.

Acute suppurating processes should never be treated by bismuth paste for obvious reasons; the treatment should be limited to old fistulous tracts with thick fibrous walls. If one closely follows the directions given by Beck the danger of bismuth poisoning will be avoided to a large extent, but some surgeons are inclined to believe that the use of some other bismuth salt, the carbonate, for example, would give more security from intoxication.

METHOD OF TREATMENT TO BE USED IN CASES OF BICHLORIDE OF MERCURY POISONING.

In the *American Journal of the Medical Sciences* for March, 1919, ROSENBLOOM states his method as follows:

1. Administer the whites of three eggs beaten up in a quart of milk and then empty the stomach by siphonage.

2. Give 300 Cc. of fresh calcium sulphide solution, containing 1 grain to 1 ounce of water, by mouth.

3. Wash out the stomach with fresh calcium sulphide solution, 1 grain to 1 ounce of water.

4. Administer in powder or tablet 0.36 gramme of sodium phosphite and 0.24 gramme of sodium acetate. If this is not available give the following:

> Sodium hypophosphite, 1 gramme;
> Water, 10 mils;
> Hydrogen peroxide, 5 mils.

Use ten times as much of the hypophosphite as poison taken. Give a copious lavage of stomach with the above antidote diluted twenty times. Give the above undiluted antidote every eight hours for two days.

5. Pour through the stomach tube after the above lavage a solution of 3 ounces of sodium sulphate and 6 ounces of water containing 5 grains of calcium sulphide. Let these solutions remain in the stomach.

6. Give intravenously, after withdrawing 600 Cc. of blood, 800 Cc. of Fischer's solution or of bicarbonate-glucose solution.

7. Wash out the stomach morning and night, giving by the mouth after each washing 5 grains of calcium sulphide dissolved in 3 ounces of water. Continue this lavage until the stomach washings are free from mercury when tested by Elliott's method and until the urine is free from mercury.

8. Give high colon irrigation of warm

water morning and night, using 8 gallons of the water for each treatment.

9. Give a hot pack twice daily.

10. Give 8 ounces of milk every second hour.

11. Give every second hour 8 ounces of the following solution, by mouth, alternating with the milk:

Potassium bitartrate, dr. j;
Sodium citrate, dr. j;
Sucrose, dr. j;
Lactose, dr. iv;
Lemon juice, oz. j;
Boiled water, oz. xvj.

12. Force the patient to drink large quantities of the alkaline waters, such as Celestins Vichy or Kalak water.

13. Give a low fat and low protein and high carbohydrate diet for four weeks. Avoid salt in food, as it increases the absorption of the mercury.

14. Give by continuous proctoclysis a solution containing a drachm potassium acetate, 4 drachms glucose, and 3 drachms sodium bicarbonate to the pint.

15. Keep the urine alkaline to methyl red.

16. Continue rest treatment until recovery, usually a period of three weeks.

CHANGES IN THE BLOOD IMMEDIATELY FOLLOWING TRANSFUSION.

HUCK, in the *Johns Hopkins Hospital Bulletin* for March, 1919, states that transfusion was performed in each instance by a modification of the citrate method of Lewisohn, as described by Sydenstricker, Rivers and Mason. The details of the technique need not be repeated here. Especial care was taken in testing the donors to be certain that the bloods were compatible. The amounts of blood given in different cases varied from 250 Cc. to 1250 Cc. Studies of the blood were made immediately before the injection, immediately after the injection, two hours, five hours, and about twenty-four hours later. These time intervals were followed rather closely in practically all of the cases. Each examination consisted of counts of the red cells and of the white cells, with a differential count of 300 white cells. Platelets were estimated in the smears and the hemoglobin was determined. Notes were also made on the morphology of the blood cells. Counts were always made with the same instruments and by the same observer, with the same reagents; and care was taken to draw the blood from the same part of the body, with uniform punctures.

The effect of transfusion was studied in seven cases of pernicious anemia, two cases of idiopathic purpura, four of benzol poisoning, five of secondary anemia, and two of Banti's disease.

Responses to transfusion were so variable that it seems desirable to append the detailed protocols. A few of the main points only will be summarized here.

Red Blood Cells.—In general, following the injection of blood, there was an immediate increase in the red cell count, the striking point being the marked increase in many cases apparently out of proportion to the quantity of blood introduced. Thus, in Case 2, the red count rose from 880,000 to 1,488,000 immediately after the injection of 500 Cc.; and in Case 5, from 480,000 to 1,300,000 following the injection of 650 Cc. Such remarkable changes indicate apparently a rapid redistribution of blood following an injection. In some cases the initial increase continued for several hours, usually falling, so that at the end of twenty-four hours the count had fallen to approximately where it was before transfusion. In other cases, however, there was a marked increase at the end of twenty-four hours. In several instances, after injection of blood, the count fell for a few hours and then rose slightly.

Hemoglobin.—The hemoglobin in most cases showed a uniform rise following transfusion, usually reaching its maximum at the end of twenty-four hours. In some cases the hemoglobin fell slightly after the initial rise. Changes in hemoglobin did not run parallel with changes in the red count, as may be seen best from the variations in the color indexes.

Leucocytes.—In practically every case following transfusion there was some increase in leucocytes. In several instances, however, they remained practically station-

ary or even fell. These relations do not seem to be constant in any particular type of case. The most striking change in the differential count is the increase in the polymorphonuclear neutrophiles, which was striking even in some cases in which there was little change in the total leucocyte count. Occasionally a neutrophilic myelocyte was seen following transfusion, but they were not constant. In these cases no outpouring of nucleated red cells occurred, although in four instances a few were seen following transfusion, but not before. The numbers are so small, however, that this may have been accidental.

A general review of the immediate effect of transfusion upon the blood count in twenty cases does not reveal any constant changes following this procedure. The point of practical interest and importance seems to be that no exact mechanical effect can be demonstrated following the introduction of definite quantities of blood. Whereas, in a general way, it may be said that the introduction of blood raises the count, the effect is essentially a biological one involving the redistribution of blood in the body, and its exact nature is not at present understood.

TRENCH FOOT.

SOMERVELL (*Journal of the Royal Army Medical Corps,* January, 1919) writes enthusiastically concerning the camphor treatment for this affection, and its efficacy. This is based on an experience of over 600 cases. Some credence seems to be placed on Raymond and Parisot's claims to having established the fact that this affection is usually a manifestation due to the invasion of a saprophytic organism to which the name *Scopulariopsis koningii* has been given; found in mud, under the toe-nails of persons afflicted with trench feet, and in the bile of severely jaundiced cases; and producing when injected into animals characteristic patches of local gangrene.

Considered entirely from the clinical standpoint the condition seems to be an acute peripheral neuritis. The slight cases, constituting 25 per cent, all complained of pain in the feet and sometimes in the calves, and more or less anesthesia, especially on the dorsum of the foot. Sixty per cent of the cases are moderate ones having pain and anesthesia with or without hyperesthesia; presenting characteristic swelling which often does not pit on pressure. Its semi-fluctuating, tense nature is characteristic. This swelling subsides in from three to fourteen days. The remaining 15 per cent, the severe cases, are characterized by swelling, disturbance of sensation, and localized discoloration, most evident on the dorsum of the foot, of a dull copper-red color, changing in a few days to a bluish shade. Part only of the discolored area persists. This soon develops a definite edge, and over the discolored area the edema resolves itself into one or more blisters of variable size which may disappear, or spread and become confluent. When they burst or are cut off an area of superficial necrosis is revealed. It slowly separates. This necrosis rarely involves more than the dermis or the subcutaneous tissues. Healing takes place at the edge of the area where the blister has been and is sometimes very rapid. In more severe cases the discoloration involves the whole of one or more toes, which become gangrenous. This gangrene seldom or never extends beyond the metatarsophalangeal joint, except that which involves the skin only. The writer has seen but two cases with serious constitutional symptoms, with high pyrexia, great prostration, and later jaundice, nephritis, and edema of the lung. Tetanus is fairly common, occurring in 1 to 2 per cent of uninoculated cases. In one series of 250 cases from the same battalion, four died of tetanus in the second or third week after exposure. As one of the prophylactic measures camphor soap is advised. The feet are dried and well powdered with camphor powder. Camphor soap is made by taking 4 ounces of powdered camphor, 1 pound of powdered borax, and 10 pounds of potash soap. The camphor powder is made up of 1 part of camphor to 40 parts of talc powder.

On admission to a dressing station or casualty clearing station at least 500 units, and in severe cases 1500 or even more units, of antitetanic serum should be given if not already done. In addition to this the feet should, in all cases, be washed thoroughly with the camphor soap. Further treatment is different for the different degrees of severity of the complaint. After the feet have been washed and thoroughly dried, they should be wrapped in cotton-wool bound loosely round with a bandage. The patient should be sent to bed, or if beds are not available, he should be made to lie on a stretcher, with plenty of blankets. The ward should be comfortably warmed. After three or four days, if pain and tenderness have to a great extent disappeared, the patient may be allowed up, at first without boots, and afterward with them. After a few days he may be given light duties in the hospital, and should not be sent back to full duty until his feet are quite fit. Two pairs of socks should be worn with the boots for several weeks after the patient has finished his treatment. Of over 100 cases of this degree of severity, 60 per cent were fit for return to duty in less than a fortnight.

The cases with swelling are practically poulticed with camphor 1 part, sodium biborate 15 parts, and water 1000 parts. Blisters are cut around the edge and all loose skin is removed. The raw surface covered with gauze is then wet with a preparation made by adding half an ounce of camphor to a pound of ether. Against this is placed the camphor, borax, and water dressing. The author insists upon the recumbent position, warmth, and comfort. He rejects massage, expectant treatment, picric acid, particularly ambrine and fomentations, and regards camphor as a specific. His views are shared in by some French surgeons.

As to the sequelæ, these patients are more sensitive to wet and cold than they were before, and hence unfitted for the type of military service which would expose them to these conditions. The similarity of frostbite is mentioned, nor does the author establish a differential diagnosis. Indeed, the two processes seem identical, except the pathology in one case is of slower development than in the other. In further corroboration of this he speaks in terms of confidence of the camphor treatment for frostbite.

THE TREATMENT OF PANOPHTHALMITIS.

LISTER (*Indian Medical Gazette*, January, 1919) observes that this condition is especially common in India. There are three surgical methods ordinarily employed for the treatment of this condition. The simplest is to incise the cornea and to allow the pus to escape. This gives relief to the pain, but it takes a long time for the eye to quiet down, after this procedure, with a consequent increased danger of complications. Under certain conditions it may be all that it is possible to do.

The other more usual methods are enucleation or evisceration of the eyeball. The majority of ophthalmic surgeons are in favor of evisceration, as deaths have occurred after enucleation from a spread of the infection along the sheaths of the optic nerve to the meninges. This complication, however, is not altogether excluded by adopting evisceration, but the risk is much diminished.

In both procedures there is a risk of sympathetic ophthalmia in the other eye. In evisceration the usual practice is to incise or excise the cornea and to scrape out the contents of the globe with a curette, the interior of which is then douched with an antiseptic lotion, or swabbed out with an antiseptic, the nature of which varies with different surgeons.

After the operation there is often a good deal of chemosis of the conjunctiva and swelling of the upper lid, and, still more important, severe and persistent pain, which is sometimes of the nature of a severe neuralgic headache. As the patient has often only resorted to operation to obtain relief from pain, much disappointment is caused. Compression of the ciliary nerves probably

is an important factor in the pain of acute glaucoma. The removal of the ciliary region results in a great diminution in the pain after operation. Some patients hardly complain at all, after coming round from the anesthetic.

The steps of the operation are as follows: The patient is given a general anesthetic. The eye is carefully cleaned and the conjunctival sac is well irrigated with 1-in-3000 perchloride of mercury lotion, as it is usually difficult to cleanse the eye properly before on account of the pain.

A cuff of conjunctiva is then turned back by making an incision round the scleral margin, and separating it carefully all round. The cuff is separated from the globe for enough back to expose the ciliary region well. By means of a Graefe knife the sclera is transfixed behind the ciliary region and the anterior segment of the eyeball is removed. The contents of the globe are then thoroughly scraped out, the cavity well douched with 1-in-2000 perchloride of mercury lotion, and a dressing applied. The eye is dressed daily till the wound heals.

THE USE OF THE CONJUNCTIVAL FLAP IN EYE INJURIES.

PUTNAM (*Journal-Lancet,* Jan. 15, 1919) thus briefly describes the conjunctival flap operations in use: The single pedunculated flap; the double pedunculated flap; two flaps, one with a single peduncle, the other with two bases; the complete flap.

The single pedunculated flap is made by dissecting the sclerocorneal-conjunctival limbus about one-third around. Then the apex of the flap is cut broadly about 1 cm. wide, and a cut made parallel upward, forming a flap, which is then laid carefully over the corneal defect, with or without suture, and a pressure-bandage is put over both eyes, remaining on two to four days. The pain disappears in two to five hours. If the first dressing is made in twenty-four hours, the flap looks like a diphtheric membrane, on the fifth day becoming intensely red, and in eight to ten days atrophying so that it appears as a diaphanous, thin membrane over the cornea, which speedily disappears, leaving the surface healed.

With a double peduncle the limbus incision is curved about two-thirds of the way around the cornea, and the flap brought straight over the corneal defect, the flap being, as a rule, attached to the limbus. In every case the raw surface left from the conjunctivoplasty is permitted to heal spontaneously, which occurs by encroachment of the conjunctiva upon the surface, covering it in about three days.

Two flaps may be used for central defects, one with a single peduncle and the other with two bases, forming a cross over the cornea. These are secured by stitches, which are cut in five to seven days, when the flaps retract to their former places and heal thereon; or they may be held together in the center by a stitch, the under flap serving for a keratoplasty and the other for a supporting flap.

In extensive penetrating corneal wounds the procedure is more difficult, the character of the conjunctival flaps varying from single and double pedunculated or double flaps, as above described, to the dissection of a large part or all of the conjunctiva at the limbus and connection of its cut edges by three or four interrupted stitches or a pouch-suture pulled tightly to completely cover the cornea.

This use of the ocular conjunctiva is for protection rather than for keratoplasty. About five days after the cornea wound has sufficiently coapted, the sutures may be cut and the conjunctiva allowed to retract to place at the limbus, where it heals, and in a couple of weeks no trace shows of its ever having been divided.

In complicated wounds of the anterior segment the prolapsed iris should be abscissed, and, if the lens capsule be injured and the body of the lens be broken up, the lens substance should be released, and a careful toilet of the wound made.

In complicated wounds of the sclera the protruding uvea and vitreous must be cut off, and the wound cleared of débris before the sclera is sutured.

The conjunctival flap is used in every case from complete incision across the cornea and into the sclera on both sides to the smallest particle of steel which penetrates the cornea, entering the globe either through cornea or sclera. After extraction of steel with the giant eye-magnet, the flap method is indicated.

The treatment of a wounded eye should be conservative from the first, in order to retain as much vision as possible, to preserve the cosmetics of the organ, and, in some cases, even to save life, as well as to relieve the agony caused by the injury.

With this maxim in view we must consider those methods which will give, first, the best results as regards vision, and secondly, as regards the appearance of the globe and its surroundings, bearing in mind always the dread possibilities of sympathetic disease in the other eye, and remembering the operation of enucleation or its substitutes with which to combat this possibility. A most trivial injury may, through neglect, ignorance, or mismanagement, result in total loss of vision in one or both eyes, disfigurement, or even death; in all cases there will be damage to the earning ability, and pain and suffering out of all proportion to the same character of injury inflicted upon other structures of the body.

BONE GRAFTING IN UNUNITED FRACTURES OF THE MANDIBLE.

Cole and Bubb (*British Medical Journal*, Jan. 18, 1919) observe that non-union can only be remedied by operative measures. To what extent and with what success surgical intervention has been invoked it is impossible to judge, for the only series of cases other than their own is that published by Platt, Campion, and Rodway. This much is certain, that for at least two years after the outbreak of war isolated attempts only were made to deal surgically with these lesions. As a rule, the attitude assumed by those in charge was expectant and noncommittal, but occasionally active hostility was encountered.

Taking all these circumstances into consideration, one must conclude that a large number of ununited fractures have been discharged from hospital, their treatment being allegedly completed. Let it be remembered that no surgeon would regard non-union of any other bone as a satisfactory termination to treatment. Let it be remembered, too, that the disability from an ununited fracture of the mandible tends to become progressively greater as teeth now used for abutments are lost: also that the maximum of disability will obtain at an age when the compensatory powers of the individual are on the wane.

The pedicled graft operation has been extended to the utmost, and as a result certain improvements have been introduced.

The fixing wire is passed through the substance of the bone, instead of surrounding it, and thus firmer and more reliable contact is obtained. At times both ends of the graft are perforated. Experience has shown that a much more bulky fragment may safely be detached than surgeons have been wont to use.

Another point not previously emphasized is the rigidly aseptic method employed. Skin margins are guarded by towels clipped to the edges of the wound; all knobs are tied with forceps and no handling of wound or graft is at any time permitted. Some may maintain that such technique is totally unnecessary and savors of surgical pedantry. It is, however, well to remember that the standard aimed at is rarely attained and that within limits it is impossible to err on the side of a too rigid technique. That the precautions taken are well within these limits is shown by the fact that the operation rarely takes more than one hour and a quarter and is often completed in fifty minutes.

To summarize the conditions which experience has shown to be needful for the performance of a pedicled graft operation:

The loss of tissue must implicate the horizontal portion of the bone—that is, the lesion must be situated at or in front of the angle.

The size of the gap should usually not exceed 4 cm. In favorable circumstances it is possible to cut a thick, well-nourished graft of 6 cm. in length, and a gap of 5 cm. (before trimming) may thus be dealt with, if end-to-end union is resorted to.

It is necessary that the tissues of the submaxillary triangle should be free from scar tissue on the side from which the graft is to be cut. It is extraordinary how frequently this area escapes even when the soft tissues of the face are extensively damaged. The multiple extraction of teeth is a policy that should be abandoned.

Progress has been throughout uneventful; an alveolar abscess occurred in one case and stitch sinuses in two others. The splints are removed in from ten to twelve weeks according to the size of the defect. At this time a slight "give" is noticeable corresponding to the plastic stage that occurs in the union of all fractures. As a rule, this bending phenomenon gradually disappears, and firm union ensues in from four to six months. Occasionally union fails at one or other end. A secondary wiring operation is then undertaken. This has been invariably successful, and the graft when exposed has been indistinguishable in appearance from other living bone. The overlap originally present permits of this secondary operation being performed without any sacrifice of occlusion.

An interesting departure is the treatment by a pedicled graft described, bearing on two cases in which previous free transplants had considerably diminished the gap but had failed to determine union. A case of this description was grafted in Switzerland. He came with free mobility but with a gap that could readily be bridged by a pedicled graft. A sinus was present at the time of operation, but no untoward effect has been noted.

The authors state that 34 cases have been dealt with by this method. In 23 the result is known, and of these 21, or over 90 per cent, have been completely successful. In the two remaining cases the patients themselves are thoroughly satisfied, but they are counted as failures in the appended table. The pedicled graft operation permits the utilization of a portion of living bone, possessed of its own blood supply, passing to it from a natural musculofascial pedicle. The method of Cavalie, for which similar claims are made, cannot justly be regarded as a pedicled graft operation. The results support this contention, for they have been far from satisfactory.

Free transplants are only employed when conditions do not permit the use of a pedicled graft.

THE HUMAN FOOT.

SMITH (*New York Medical Journal*, Feb. 8, 1919) in the course of his highly instructive remarks on this subject observes that nothing produces a more rigid and intractable type of flatfoot than gonorrheal arthritis. This type of foot is distinct. The foot bulges at the junction of the scaphoid with the head of the astragalus abruptly inward. There is not an inward bulging of the whole longitudinal arch as seen in ordinary flatfoot of other types. It is very painful and makes very rapid progress. An arch support under this sort of a foot, until the inflammatory condition is over, is torture. These feet must not be submitted to the pressure of arch supports, or special shoes, until they have been placed in plaster of Paris for some weeks and the original source of the infection eradicated by appropriate treatment. Never, under any circumstances, should a forcible effort be made to correct such a foot. The correction will fail utterly, will excite the most serious osteoarthritis, and the after-pain will remain for weeks or months, leaving the foot even more distorted than before. Such feet should be thoroughly well padded, placed in plaster of Paris from toes to knee, with the foot in as nearly a corrected position as can be borne by the patient. All focal centers of infection should be found and eradicated. If the feet have been put up in plaster for some weeks it will be found, in most cases, that the soreness has gone and a beginning ankylosis has materially lessened or disap-

peared. Any marked case of flatfoot, in which the surgeon cannot bring the foot to a right angle with the leg with the arch in the corrected position, should always be placed in plaster of Paris for from four to twelve weeks before attempting to place any arch support in a shoe, or having a special shoe constructed.

Sheet wadding should have no place in surgery. It is vile stuff underneath plaster of Paris. It is not properly cleansed; it is non-absorbent; it is oily; it contains portions of seed hull of the cotton seed, which are irritating to the skin; it retains the perspiration next to the skin, which undergoes rapid decomposition and becomes offensive in a few days. Good absorbent cotton properly cut and shaped, applied smoothly and bound down by a thin gauze bandage, makes an ideal dressing. Plaster of Paris when applied to the foot should be filled in underneath the arch, so as to give a sort of rocker shape to the sole of the dressing. This serves two purposes: it prevents the dressing from breaking down, and enables the patient to walk comfortably without being inconvenienced from not being able to use the ankle-joint. Very much of the plaster-of-Paris work of the present day is poorly done, with increasingly poor results, which serves to bring plaster of Paris into disrepute in surgery. Dr. Lewis A. Sayre in describing the method of making plaster-of-Paris bandages said: "Get crinoline, wash out the starch and dry carefully, and then make the bandages." The profession have ignored his advice about washing out the starch, which at the present day happens not to be starch, but glucose sizing. For the same reason that cane-sugar has a partially solvent effect on plaster of Paris, so also glucose sugar or syrup. This glucose sizing in the crinoline which is used in most of the hospitals, the world over, makes the plaster dressing damp and cheesy and has a disintegrating effect on the plaster, causing it to crumble. Unsized gauze, with a coarser mesh than the ordinary bandage gauze, should always be used. As to the plaster, it is not sufficiently explicit to say dental plaster, because there is more than one sort of dental plaster. Commercial plaster of course is impossible. Dental impression plaster should always be used, and a most excellent modification of this plaster is an addition of five per cent white cement, such as tile-setters use in placing light-colored or white tile on the interior of bathrooms, thoroughly mixed with the plaster. Never put any foot afflicted with chilblains in plaster of Paris.

Arthrodesis performed in the usual way, or by some of the newer methods in which a bone graft is inserted, is of very doubtful expediency. Where the bone graft is inserted, frequently the denudation of the bone from its articular cartilage is not thoroughly done, with a result that there is non-union and the bone graft promptly breaks. Most patients will not submit to having their foot encased in plaster of Paris for from three to six months. Firm union of the bones in the mediotarsal region will not often take place in less time. These feet are generally painful for months, or years, or as long as the patient lives. The worst and most ridiculous of all procedures is to detach the tendon of the anterior tibial muscle, bore a hole through the scaphoid, draw the detached tendon through this hole and stitch it to the bottom of this bone. The muscle is already somewhat atrophic, overstretched, and almost useless. To still further incapacitate it is unsurgical. Metal arch supports are obsolete. There is seldom a case requiring their use. Any arch support will be an utter failure if placed in a shoe with a weak shank. The shoe must be strong enough to carry the person's weight without yielding at the shank, or the metal support will break, and any other support will sag out of shape. The supports found on the market are of the deformed type, corresponding to a flatfoot. They serve only to perpetuate the deformity and batter and bruise the mediotarsal bones, sometimes leading to serious osteoarthritis.

The method of making plaster-of-Paris models of flat feet, as is most often done, is inefficient. The model when it is done is a

beautiful reproduction of a flat foot, and any arch support made over it most certainly would serve to perpetuate the deformity. Arch supports should be made of a good quality of piano felt cut and properly shaped so as to raise the foot underneath the ankle-joint, and not so much under the scaphoid and internal cuneiform bones. This felt is placed between properly molded pieces of sole leather and covered with a piece of goat skin. It is made the shape of a normal foot. It is very light and is flexible. When put inside of a shoe with a strong shank, it will hold the patient as well as any other arch support in use. The author has one patient weighing 287 pounds, who has been almost helpless for seven years from flat feet; the late Dr. Lewis A. Sayre said: "The hollow of her foot certainly made a hole in the ground." She is walking about very happily on a pair of felt arch supports and a pair of strong, ordinary shoes.

Swing last shoes are an abomination with which the present market is flooded. The original Munson last was a partial swing last, and for that reason not as good as the modified Munson last now in use in the United States army. The swing last shoe has no effect in preventing or curing flat feet. It will ruin the metatarsophalangeal joint of the little toe, and frequently the third, fourth, and fifth toes also, causing no end of torture to this part of the foot; it makes many corns and is a grotesque and inhuman invention. The most grotesque shoes with an exaggerated swing last are now on the market and largely advertised: they are the production of imbecility and are harmful.

Associated with flatfoot we frequently find a breaking down of the transverse arch with metatarsalgia. This is not due to a pinching of a nerve trunk between the heads of the metatarsal bones. The pain is due to an arthritis in the metatarsophalangeal joints, usually of the second and third, or third and fourth, toes. The condition is nearly always accompanied by one or more calluses underneath the ball of the foot. Frequently the extensor tendons are contracted and the toes stick up on the foot after the fashion of a duck's head and neck. Careful manipulation of the joints involved will show them to be inflamed and very sensitive. A sort of half-pear-shaped pad of piano felt glued to an insole, or to the sole of a felt arch support, and covered with leather, so as to lift up the second, third and fourth metatarsal bones, but never the first and fifth, will relieve this condition or cure it.

Associated with flatfoot we often find bunions with hallux valgus. Recently a number of operations have been devised which are no better and no worse than the old stereotyped resection of the joint. These operations are utterly bad. They are a useless mutilation of the foot. Barring cases in which caries is present the joint should never be obliterated. The head of the metatarsal bone should always be spared. Resections of the bone are uncalled for and useless. Transplanting of tendons in this condition is an unwarranted meddling with those structures. About thirty years ago Watson-Cheyne of London devised an operation for bunion which is so simple and easy of performance, so logical, and gives such excellent results that it failed to attract attention in the profession of surgery. Watson-Cheyne's operation gives admirable results and leaves the foot unblemished. A crescentic incision with the convexity upward is made from a point about three-fourths of an inch anterior to the joint and brought down to a point about three-fourths of an inch posterior to the joint. Incision should not wound the extensor tendon of the big toe. The flap is laid down on a level with the sole of the foot. If there has been an inflamed bursa underneath this flap the inflammatory tissue should be carefully dissected out before operating on the joint, care having been taken not to injure the internal lateral ligament. The internal lateral ligament is then divided in front of the joint from above, downward, and reflected backward. The bunion is freely exposed and sliced off with a metacarpal saw, being

careful not to saw into the head of the bone. The edges of the saw cut are smoothed off and the big toe forcibly overcorrected. If it does not yield readily, the external lateral ligament may be nicked by a tenotome, bringing the big toe into marked overcorrection. The internal lateral ligament is resected and shortened and then sutured so as to hold the toe in overcorrection. The flap is then closed with a silkworm-gut suture. A splint made of thin board, cut so as to hold the toe in marked abduction, is well padded and applied to the sole of the foot and toe. The splint should go from the heel to the end of the toe, and be securely fastened so that it cannot slip laterally. Plaster of Paris is useless.

Patients with feet in plaster of Paris for correction of flatfoot should be allowed to walk freely. Many of them can resume their daily occupation. Rigid flatfoot, not due to infection either latent or active, should have the feet forcibly corrected under an anesthetic and then placed in plaster. Exercises and manipulations, as practiced both in and out of the army, may come to have a very useful place in the convalescent treatment of this condition. Otherwise they are out of place and show a lack of understanding of this most prevalent and troublesome condition.

STATUS OF THE X-RAY IN HYPERTRICHOSIS.

GEYSER (*Urologic and Cutaneous Review*, February, 1919) says that hypertrichosis in the ordinary sense can hardly be considered a disease; yet when there exists an overgrowth of hair where normally we are accustomed to finding none, then such an overgrowth is at least a serious disfigurement if not an actual deformity. The cause for such an overgrowth of hairs is purely speculative. However, the presence of a large number of hairs upon the face of the average woman is not only unsightly, but frequently is the cause of psychoneurotic manifestations of a grave character.

The vibrations emanating from an *x*-ray tube are so rapid and the wave length is so short that ordinary tissue offers little or no resistance to their passage. It evidently was not foreseen that the living cells would ever be exposed to such vibratory rates. The cells seem to possess no means for protection against the baneful effects of the *x*-ray. It is the nucleus of the cell which, when exposed to the *x*-ray, undergoes a degenerative change, from more or less disintegration to complete destruction. Since it is the office of the nucleus to preside over the character of the succeeding generations of cells, it is clear that when the nucleus is totally destroyed, generation of new cells will be impossible. It is also of easy comprehension that the higher and more complex the individual cell function, the easier is it damaged by exposure to the *x*-ray. Hence one of the almost universal accompaniments of work within the sphere of *x*-ray influence is an entire absence of spermatozoa. There is nothing upon the outside of the body, the skin, to indicate such a condition. Owing to the highly organized structure and function of the testicles or ovaries, they are promptly affected and their function is usually permanently interfered with.

Squamous epithelium or skin cells are of the simplest order of organization, hence last and least affected. A hair cell is of a somewhat higher construction and composition, therefore the nucleus of a hair cell is more readily and more seriously injured, before the skin cell is even aware of the presence of the *x*-ray. It is just this difference in the ratio of susceptibility that makes the *x*-ray useful for the permanent destruction of hair cells, usually without injury to the overlying skin cells.

The greatest variation exists in the ratio of susceptibility, not only in the hair and skin cells, but also in different individuals and even in the same individual at different times. A patient in good normal health may take a certain dose without the slightest reaction in the skin; at another time, especially if the patient has become anemic from some cause, the previous therapeutic dose

now becomes an overdose and sometimes with serious consequences from the radiodermatitis. The only redeeming feature is the fact that while the dermatitis and the following telangiectasis may be bad, the hypertrichosis in most cases is worse.

The *x*-ray will cause the permanent destruction of the hair follicles in less time than any other agent known.

With the best of care and understanding the *x*-ray as a depilatory agent is difficult to control.

After the preliminary test dose, the massive dose system has proven itself safer and better than the small, oft-repeated dose.

After the hairs have been shed, they will return in about six weeks' time. To make the baldness permanent a therapeutic dose must be administered once per week during six weeks.

The *x*-ray should only be advocated when all other means, such as electrolysis, the constant use of depilatories, shaving, etc., no longer answer the purpose.

CANCER OF THE TONGUE.

D'Arcy Power (*British Medical Journal*, Jan. 11, 1919) reports that an examination of St. Bartholomew's records shows that 169 persons were admitted with cancer of the tongue during 1909-1916, nine of whom were women. Of the latter seven were married. None of these women smoked, but they all had bad teeth. The majority of them gave a history suggestive of syphilis. In the case of the men 93 out of 160 were syphilitic. Many of the patients had drunk to excess.

The evidence brought forward pointed to a close association between syphilis and cancer of the tongue. The syphilis may be active; it is more often quiescent or even extinct, and the conclusion arrived at was that, as in some cases of tuberculosis, "syphilis makes the bed upon which cancer is born." It appeared further that an increase in the number of deaths from lingual carcinoma has occurred after the periods when mercury has temporarily fallen into disuse in the treatment of syphilis. Such insufficient treatment was the rule in the later years of Queen Elizabeth's reign, when guaiacum, sarsaparilla, and the "vegetable" cures displaced the original mercurial methods; during the Regency period, when some of the army medical officers nearly succeeded in abolishing the use of mercury; and again in the early Victorian era, when the value of potassium iodide was unduly exploited. It is interesting to notice that many of the patients whose cases are recorded at St. Bartholomew's Hospital stated voluntarily that they had only been treated with mercury for a fortnight or three weeks, after which they considered themselves cured.

Syphilis cannot be considered as more than a predisposing cause of cancer of the tongue, because lingual carcinoma occurs in animals. An exciting cause, therefore, must be looked for, and that cause must have become more prevalent during the last fifty years if the increase in cancer of the tongue is to be attributed to it. The cause must also be one which acts in men more than in women. The increased consumption of tobacco seems to fulfil these conditions. Cancer of the tongue did not become frequent until some years after the introduction of smoking in the last quarter of the sixteenth century. The habit spread slowly during the seventeenth, eighteenth, and nineteenth centuries, until cigars could be smoked openly in the streets by the upper and middle classes, though pipes were taboo in public. Cigarettes were introduced about 1877, and from that time the smoking of tobacco has steadily increased until it is now an almost universal habit with both sexes from adolescence onward. Smoking acts in two ways as an irritant to the tongue, partly through the nicotine and partly by the increased heat in the mouth, which is measurable by the thermometer. In the latter respect it may bear the same relation to cancer that heat does in kangri cancer, where the thermal irritation appears to be a definite factor in the production of epithelioma. Although the predisposing and the exciting causes of cancer may be known,

the actual cause has yet to be discovered; but if two factors are recognized, it ought not to be impossible to discover the third.

In conclusion the author thought that it was theoretically possible to reduce cancer of the tongue to the subordinate position it occupied in man before the seventeenth century, and which it still holds in the domestic animals. This could be effected by a thorough treatment of syphilis in its initial stages. Persons who were being treated for syphilis should be told never to smoke, not to drink to excess, and to pay regular visits to the dentist. Such advice should be given whilst the patient was still under treatment, and should not be deferred until the tongue had become sore. Failure to follow this advice or a continuance of the treatment of syphilis on ineffective lines would be followed in all probability by a very large increase in the number of patients with cancer of the tongue. This increase should begin about 1950 and should affect women as well as men, for syphilis is now more widely spread amongst the younger generation than it has been for many years, and both sexes smoke much larger quantities of tobacco than ever before.

THE POSITION OF THE OPERATION FOR EXCISION OF THE SEMI-LUNAR CARTILAGE IN SURGERY.

Hammond (*British Medical Journal*, Dec. 28, 1918) states that the average stay in hospital following an operation for excision of the cartilage is in the case of civilians three weeks. In four weeks the patient is again back at work. In the case of soldiers the prognosis is not nearly so good. The total number of cases of soldiers admitted with a diagnosis of displaced cartilage to the end of 1917 was 283. This was at the Alder Hey Military Orthopedic Hospital. One hundred and twelve were operated on for the excision of the cartilage or synovial fringe. In many of the remaining 171 nothing abnormal could be found, while in others only a slight wasting of the quadriceps could be observed. In 20 cases definite osteo-arthritis was observed, in 7 tuberculous disease, in 4 villous synovitis, and in one sarcoma of the lower end of the femur.

Of the 112 cases operated upon, 8 were discharged as fit for general service immediately; 99 were discharged to the commanding depot as fit for general service within four months; and five were discharged as fit for home service only. The average stay in hospital after operation was 85 days. Wasting of the quadriceps occurs in all cases of internal derangement. It may also occur in the normal knee which is kept stiff and not in full use. Consequently while the absence of wasting indicates that there is nothing abnormal in the joint, its presence, while supporting, does not prove that some derangement exists.

Under no consideration was the operation performed until something more than a soldier's statement was present to warrant the diagnosis.

Complete recovery following the operation was in many cases delayed. When the soldier was anxious to rejoin his unit the average stay in hospital was one month. In other cases the soldier was anxious to prolong his stay in hospital and complained of weakness and inability of the knee, though full movement was present. In such cases wasting of the quadriceps was the only physical sign. A soldier with such symptoms and the added wasting of the quadriceps might obtain sympathy when inspected by another medical officer. Consequently no soldier was discharged to a command depot until the quadriceps had regained its full volume and strength under massage, gymnastic exercises, and electrical treatment. Without the coöperation of the patient this was often delayed, and accounts for the prolonged postoperative stay in hospital.

When, in spite of all treatment, wasting persisted, the patient was discharged to sedentary work; this accounts for the five cases discharged as fit for home service only.

The patient on joining the command depot is often anxious to avoid long route marches, and now complains of pain in the

scar, weakness and instability of the knee, and walks with a limp. Wasting of the quadriceps again arises. With an unsympathetic medical officer the soldier realizes the game is up, and is soon passed out Class A. Should the medical officer show any sympathy the symptoms persist, and the soldier is eventually passed out in a low category. This is especially likely to happen in the case of medical officers who believe that the excision of a cartilage prevents a soldier from again becoming fit for active service. Such judgment is not in accordance with facts, and simply encourages malingering.

That too much attention is paid to subjective symptoms and too little to physical signs is especially shown in the case of men discharged in whom nothing abnormal was present in the knee; only 33 per cent of such cases were passed fit for active service.

From a purely military aspect an operation of choice is only justifiable if it raises the soldier's category, or relieves him of a condition the persistence of which would be harmful. It is dangerous for a soldier, liable to recurrent dislocation, to be placed in the firing line. The highest category in which he should be put is B (garrison duty); and then only if recurrence is infrequent, otherwise arthritis may arise.

Internal derangement of the knee in the intervening stage is easily simulated. In a doubtful case the conscientious medical officer will often give the patient the benefit of the doubt, since he realizes the risk of sending the genuine case back into the firing line, and knows that subjective symptoms without definite physical signs are not uncommon. Were all such cases to be returned to the firing line a grave injustice would be done to the genuine case. On the other hand were all the cases to be placed in Class B malingering would certainly increase.

Careful investigation of all doubtful cases is essential, and owing to the increased facilities for diagnosis most of these cases find their way to the home hospitals. It is the difficulty of proving that anything wrong is present in the knee that accounts for the prolonged preoperative stay in hospital.

Full movement of the knee after an operation is usually regained in three weeks, and graduated exercises should then be started. There would be no necessity for the cases to stay in hospital were it possible for them to be sent to a special command depot to be under the supervision of a medical officer who understands his work, and the method of developing the quadriceps by graduated and resistance exercises. The postoperative stay in hospital would thus be considerably reduced and a much larger percentage of the patients would rejoin their units in a much shorter period of time.

That only 53 per cent of the men discharged are finally passed as fit for general service is due to lack of judgment and perhaps energy on the part of the medical officers at the command or regimental depots.

ADMINISTRATION OF ARSENIC IN SYPHILIS.

LOCKHART and ATKINSON (*British Medical Journal,* Jan. 11, 1919) thus describes the method of giving arsenic in concentrated solution:

The apparatus required is to be found in the most modest surgery, for it consists of a hypodermic syringe and two or three small basins, although, where a large number of injections have to be given, several other articles may be used to increase speed and efficiency.

They have found that, by the method about to be described, two officers and two orderlies can give from fifty to seventy intravenous injections of arsenic and the same number of intramuscular injections of mercury in less than an hour.

After trial of a number of hypodermic syringes, the one they have found most useful is a cheap two-piece glass syringe made by Maw of London. The points of special advantage are a comparatively long barrel, of moderate diameter, so that, although graduated to 2 Cc., it will really hold nearly 4 Cc., while its narrow diameter

enables the needle to be introduced at an acute angle with the skin. The plunger fits accurately and may be entirely withdrawn. There are no metal contraptions at either top or bottom. The tapering connection has no shoulder, and fits well, so that there is no leaking, and the needle, when in place, is firm, but can be easily removed. The needle is rather larger than the ordinary hypodermic needle and has a shorter point, so that, while a vein is easily picked up, there is less danger of a through-and-through penetration.

A burette (30 Cc.) containing the sterile water is held upright by a stand, and is continued at the bottom by a short piece of rubber tubing, terminating in a glass nozzle and closed by a pinch-cock. One of the orderlies flames the outside of an ampoule of the drug with a small alcohol lamp, files off the tapering end, runs in 2 Cc. of water from the burette, and inserts a piece of small glass tubing with rubber connection at one end and a few filaments of wool at the constriction near the center, such as is supplied with galyl ampoules. The ampoule is then gently shaken. Solution is complete in a few seconds. The ampoule is placed upright in a small board which has had sufficient half-inch holes drilled in it to hold the required number of ampoules.

The officer, having picked a syringe out of a small basin of alcohol with dressing forceps, washes it in sterile saline solution, aspirates the contents of the ampoule by means of the rubber connection to the glass tube, picks out one of several needles which are boiling in a container beside him, and adjusts it to the syringe. Meanwhile the other orderly has prepared the patient by fastening a light rubber tube round the upper arm and painting below the bend of the elbow with iodine. The patient seats himself at a narrow table on the opposite side from the officer, his arm resting on the table. The officer, steadying the skin with his left hand, introduces the needle into a vein, slightly withdraws the plunger to make certain that the needle is in the lumen of the vein, and, removing the tourniquet, completes the injection. The table should be so placed that the light falls freely on it. The needle puncture is so small that no bleeding takes place and no cotton or collodion is required to seal it.

The officer, having completed the injection, washes needle and syringe, and returns the syringe to the alcohol and the needle to the boiling water. He picks out a second syringe and proceeds as before, using the syringes alternately.

It would be quite feasible, of course, for one medical man to do all this himself, but he would require several minutes to make each injection.

During the past three months 2859 intravenous injections have been given in the above manner in this clinic. There has not been a single case of thrombosis of the vein. There has not been an early reaction of an anaphylactic character such as used to be fairly frequent when injecting large quantities of distilled water which was not above suspicion. There have been no reactions, late or early, which could be attributed to the method of administration. Owing to the small size of the needle the pain of introduction is less than where the larger needle required by the gravity apparatus is used, and much smaller veins may be successfully entered. On three or four occasions the vein has been missed or completely penetrated, and the solution has been injected into the surrounding tissue. This accident causes a good deal of pain, swelling, and disability, which, however, pass off in a few days without abscess formation or permanent induration.

A microscopic examination of blood withdrawn from the vein into the syringe containing the arsenic solution shows the blood cells apparently perfectly normal even some hours after withdrawal.

The drugs used by the authors have been novarsenobillon and novarsenobenzol, which have been supplied in ampoules containing 0.6 gramme and 0.9 gramme. The smaller doses when required have been obtained by splitting one or more of these, when dissolved, between two patients.

Distilled water is used in making the solutions, but only a very small quantity is required, and it is pointed out by Thibierge that ordinary sterilized water free from gross impurities may be used in this small amount with impunity. The administration of arsenic in concentrated solution is more effective than when it is given diluted.

It has been shown that intravenous arsenic as ordinarily administered is eliminated pretty rapidly by the kidneys, so that a large part of the dose is disposed of in this way within a few hours after administration. The diuretic effect of the distilled water and saline solution introduced into the circulation along with the arsenic may have something to do with this, and it is reasonable to suppose that when the dose is given in concentrated form it is less rapidly eliminated.

When arsenic is administered by a gravity apparatus it is customary, in large clinics at any rate, to dissolve the doses for several patients at once, and, as the solution is run out, more is continuously added during the period of an hour or longer, according to the number of patients. It is clear that in this way some portion of the drug will be exposed to the air for a considerable time, as the tube is never allowed to entirely empty itself, and some degree of oxidation is bound to occur.

Where solution is effected in the ampoule immediately after it is opened and the contents injected within a minute or less, oxidation prior to administration must be very slight indeed. In default of support from estimation of the rapidity of arsenic excretion, it must be admitted that the number of cases is too few and the period of observation too short to establish the truth of the supposition that concentrated solutions of arsenic are more effectual than dilute, but there is sufficient evidence to show that by their use syphilitic lesions undergo very rapid involution, and that their administration in suitable dosage is perfectly safe.

One of the difficulties experienced by the clinic has been that of insuring the attendance of soldiers discharged as outpatients for the remainder of their hospital treatment. Many of them are from units stationed in camps at a distance from the hospital, and the necessary transport was not available in sufficient quantity. To overcome this a system has been arranged whereby an officer and substaff with their equipment, which is carried in a small box, visit the two outlying camps for one-half day a week.

The largest number treated in one-half day has been 100, but with a better system of organizing parades beforehand this number could easily be increased. Where any large number of cases are reporting for treatment in this manner another officer familiar with the disease should be in attendance for the purpose of examining certain of the men prior to their receiving treatment. Urine tests when required should be carried out beforehand.

Some such system of peripatetic clinics might well be utilized by the public health authorities when they deal with the control of syphilis among the civilian population, although in England there are probably few places not within reach of one of the larger towns, where it is presumed treatment clinics already exist.

THE AFTER-RESULTS OF GASTRIC OPERATIONS.

STRETTON (*British Medical Journal*, Jan. 4, 1919) on the basis of a series of 175 operations, 21 of which were instances of perforation of the stomach or duodenum, notes that he has done 116 gastroenterostomies mainly for the purpose of establishing a new route for the exit of foods into the jejunum because the pylorus was partially occluded. He reports an immediate mortality of 2 per cent, with failure of not more than 5 per cent, although there were three cases in which complications occurred at a later period, two due to jejunal ulcer and one due to intussusception. Pylorectomy is theoretically the more rational procedure, but not always successful.

The author reports the reopening of the abdomen to find that the pylorus had contracted again, although this was not a case of malignancy. He then did a gastrojejunostomy, and the patient has remained well for ten years since. He reports a case of gastrectomy for carcinoma some fifteen years ago, the patient still remaining well. There was one case of gastric resection, together with the removal of a portion of the pancreas, this patient remaining well for four years and dying from tetanus incident to a wound. He reports another case operated on in 1903, the wound exhibiting a mass of growth which was so adherent to the liver and pancreas as to be irremovable. It was regarded as malignant and gastroenterostomy was performed. This patient was well ten years later, but has since been lost sight of.

The author is not enthusiastic over the operation of gastrostomy for relief of stricture of the esophagus. He contrasts the results of surgical treatment for pyloric obstruction with those obtained by more conservative means, greatly to the advantage of the surgeon.

OPERATING TO THE CLOCK.

Under this title O'Conor (*British Medical Journal,* Dec. 21, 1918) expresses the conviction that more lives may be saved by surgeons "putting themselves under the authority" of the clock than probably has been heretofore generally appreciated.

In operative surgery, as in sport, there are some who focus the situation and put their ideas into action more promptly than others, but this by no means implies that the lightning operator or fast player is necessarily the best exponent.

Celerity in operation, apart from cinema or sleight-of-hand exhibitions, is, and always must be, sternly subject to one irrefragable law—there must be no scamping of the cardinal principles of surgery. Any infraction, notably inadequate attention to injured blood-vessels, interferes with the physiological repair of wounds, and not infrequently determines the fate of the patient. But given conscientious workmanship, it is reasonable to infer that the success of many desperate operations must be in ratio to the time occupied in their performance, since experience has amply proved that the longer the exposure the greater becomes the risk of shock and other complications.

He publishes a series of 1200 odd operations each completed within a ten-minute limit, solely intended to impress on surgeons who may not, as yet, have found their stride, that design, detail, and execution form an interdependent trio, which by constant association and practice develop automatic coördination between the brain and hands, admitting of concentration and rapid application, with a corresponding economy of time, which may, in some instances, be the vital factor in the operative result.

In this list are included 208 appendectomies, over 100 salpingo-oöphorectomies, 14 vaginal hysterectomies, 13 cholecystectomies, 21 nephropexies, 10 nephrolithotomies, 23 suprapubic prostatectomies, 80 Bassini cures of hernia, over 200 modified Whitehead operations for hemorrhoids, 2 for cancer of the tongue, 7 for mastitis of the breast. There is nothing so conducive to expeditious surgery as knowledge of the anatomy of the part, nothing so detrimental as unnecessary chatter, and there is no greater handicap than that obsession of overcare which often ends in fumbling into or laying the very traps which the indecisive brain is laboring to avoid.

TUBERCULOSIS IN INFANCY AND CHILDHOOD.

Friedman (*Colorado Medicine,* January, 1919), Römer, Hamburger, Behring, and others, have established beyond dispute that tuberculosis finds its inception in childhood and that the infection, in the vast majority of instances, remains localized and latent throughout life. In a small minority the process becomes active within a variable period after invasion. Knopf ascertained from American sources that

tuberculosis is most likely to assume activity below the age of eighteen. Not a few place the figure as low as three to ten years.

The prevalence of childhood infection is in a measure dependent upon the frequency of adult tuberculosis in a given locality, and in no small degree on economic, social and intellectual forces in operation. Burkhardt, in fourteen hundred sections, failed to find a single instance of tuberculosis in the new-born; found twenty-eight per cent affected under five years; and from there on a steady increase in frequency to the age of fourteen years, when eighty-seven per cent were found harboring tuberculous lesions. Albrecht, in three thousand two hundred and thirteen autopsies, found fourteen and six-tenths per cent tuberculous under one year, forty-four per cent between two and six years, and fifty per cent between six and twelve years. Bartlett, in one thousand one hundred and thirty-one autopsies at the New York Babies' Hospital, found an incidence of sixteen and four-tenths per cent of tuberculosis-positive cases.

The application of the tuberculin tests gives, as might be expected, a higher percentage of positive findings; for thereby a lesion, which might readily escape the pathologist because of its inaccessibility or microscopic size, will be revealed.

Based on these tests, Hamburger finds one per cent tuberculous during the first year of life; second year, ten per cent; third and fourth years, twenty-five per cent; fifth and sixth year, fifty per cent; seventh to tenth years, seventy-five per cent; and eleventh to fourteenth years, ninety-five per cent. Müller of Berlin reports fifty-six per cent reacting positively at puberty; Moro, sixty per cent; Nothman, eighty-four and a half per cent; Mantoux of Paris, eighty-five per cent; Calmette at Lille, ninety-four per cent; and Von Pirquet, ninety per cent. Hess, in New York children, has obtained five per cent positive under one year, thirty-five per cent one to two years, seventy-five per cent two to five years

The majority of observers agree that in approximately ninety-five per cent of the cases of tuberculosis the respiratory route constitutes the portal of entry, and the lungs the seat of the primary lesion. Ghon, on the basis of an enormously large and painstaking autopsy record, concludes that the aerogenous route is overwhelmingly the most frequent path of invasion.

Ravenel deprecates the tendency to assume that the most advanced lesion in the body is necessarily the primary focus. By feeding experiments, he produced fatal pulmonary tuberculosis in animals, causing an insignificant intestinal lesion, whereas the apparently oldest was found in the lungs and bronchi. It has been conclusively proved by Deist, Behring and Römer that an intact mucous membrane may permit the passage of bacteria without a demonstrable lesion resulting at the point of entry. Wagner found in seven hundred and fourteen children one hundred and forty tuberculous ones, and fifty-three of these showed the primary lesion in the intestines. Billings is also an advocate of the idea of the digestive tract being a frequent portal of entry. Albrecht, in one hundred and six cases, found the tonsils the primary seat of tuberculosis three times.

During child-life, the glands, lungs and meninges are the sites of predilection of the tubercle bacillus. The younger the child, the more likely a generalized tuberculosis. Weber, in one hundred and five autopsies in children under fifteen years of age, found sixty cases of abdominal tuberculosis, twenty-five of cervical, seven of general, three of bone and joint, six of skin, and four of tonsillar. Baldwin finds the lungs invaded in fifty per cent of childhood tuberculosis, the glands ranking next in frequency. Of the glandular involvements, Cruikshank finds the tracheobronchial group most often diseased, then the mesenteric, and lastly the cervical.

All are agreed that tuberculosis in infancy and childhood is often extremely difficult of diagnosis. The symptoms will depend in a degree upon the location and the degree of activity of the tuberculous

process. Certain symptoms due to the liberation and absorption of the specific toxin characterize all active forms of the disease. The most important of these are stationary or declining weight, impaired appetite, lassitude, pallor, digestive disturbances, and, most suggestive of all, fever. This is usually remittent in type, of moderate elevation, and in evidence in the afternoon. Hamburger believes that a difference of one degree C. between the morning and evening temperatures, irrespective of the height reached, is significant of a tuberculous infection.

Tracheobronchial gland and pulmonary tuberculosis frequently coexist. In addition to the constitutional symtoms, a peculiar metallic non-productive cough, not unlike that associated with pertussis, is perhaps the most significant symptom of adenopathy. We frequently encounter paroxysmal attacks of dyspnea, expiratory at first, and later inspiratory as well. Expectoration is rare, and hemoptysis likewise exceedingly uncommon, though Rolleston and Ross report a fatal pulmonary hemorrhage in a child of four years. Interscapular pain radiating to shoulders may be complained of.

Among the most important localizing signs and symptoms of tuberculosis of the intestines, mesenteric glands, and peritoneum are abdominal distention, constipation alternating with diarrhea, intermittent colic, and digestive disorders.

The various tuberculin tests constitute indispensable diagnostic aids; the most commonly used is the Von Pirquet, because of its ease of application and absolute freedom from untoward effects. A positive Von Pirquet connotes a tuberculous focus, active or latent, somewhere in the body; the mere presence of tubercle bacilli will not give rise to a positive cutaneous test unless specific structural changes have resulted. The younger the subject the greater the value that attaches to a positive Von Pirquet. Many of the infectious diseases, notably measles, will temporarily render a preëxisting positive cutaneous test negative. According to Ellerman and Erlandson, the reaction is most pronounced during the early stages of an active process and decreases in intensity with an extension of the diseased process or the decline of the vital forces.

It is evident that the child must figure prominently as a factor in every movement calculated to check the progress of tuberculosis. Heretofore it has been accorded but scant, if any, consideration. The fundamental principle in prophylaxis consists in the removal of a child from a tuberculous environment, particularly during the first three or four years of its life, for at this period the body defenses are wholly inadequate to cope with tuberculous infection, and the toll of death exacted is appalling. It should be emphasized at this juncture that according to Hamburger a few minutes exposure may suffice to transmit infection to a child; Webb claims that as few as ten bacilli may be responsible for a tuberculous infection; and Roepke contends that the exercise of the most extreme precaution will prove unavailing in protecting a child exposed over a considerable period to droplet infection. It is ardently to be hoped that the brilliant results credited to the Oeuvre Grancher in France will stimulate the establishment of similar institutions in this country. During ten years of its activity over a thousand children were removed from a tuberculous milieu and properly cared for, with only one death resulting from tuberculosis. Every effort should be bent toward insuring the highest degree of physical well-being in the children, especially during the stress and strain incidental to school life; and we must scrupulously guard against all debilitating influences and all infections, particularly measles and whooping-cough, which are notoriously frequent precursors of chilhood tuberculosis. Nor are we to permit ourselves to be blinded to the real dangers that lurk in infected milk, by the bold claims of Riviere, Andword, and others, who not only deny that any possible harm can accrue from the use of unboiled bovine-bacilli-containing milk, but actually attribute immunizing effects to its ingestion.

REVIEWS.

ROENTGENTHERAPY. By Albert Franklin Tyler, B.S., M.D. Illustrated. C. V. Mosby Company, St. Louis, 1918. Price $2.50.

This book of only 160 pages contains no less than 111 illustrations, the first of which deals chiefly with apparatus, and the later ones with illustrative cases before and after treatment. The important point to the general practitioner is not so much to read this volume with the idea that he may apply the *x*-rays for therapeutic purposes as that he may be able to recognize cases in their early stages while they are still curable and refer the case, which he necessarily is incompetent to treat, to those who make a specialty in this line and who are, therefore, so skilful as to promise the best results. Not that any regular practitioner of medicine is willing to promise a cure in such cases, but that these methods hold more of promise than any other that is at our hands, except the employment of radium, which also should be employed only by those who not only have the funds with which to purchase the substance, but the knowledge as to how to apply it.

We think that our readers will be particularly interested in seeing the remarkable effects which the *x*-rays can produce in cases which at first sight look most discouraging.

INFECTION CARRIERS, Their Significance and Management. By Charles D. Simon, M.D., Philadelphia. Lea & Febiger, 1919. Price, $2.25.

Now that we know that typhoid fever, diphtheria, and cerebrospinal meningitis are disseminated very largely by carriers, not to speak of dysentery, poliomyelitis, pneumonia, influenza, and a number of other infections, a book on this subject is most timely. In a small volume of 250 pages Dr. Simon has given us a most useful summarization of the subject as it exists to-day, including not only the diseases that we have mentioned, but cholera, plague, the different types of dysentery, streptococcus infection and influenza, and ending with an appendix containing State laws and regulations relating to infection carriers and also municipal ordinances governing this matter. There is also information in regard to maritime quarantine, the quarantine laws of the United States, and interstate quarantine regulations. In the main body of the book methods are given by means of which these carriers may be identified and isolated, and measures are described by which they are to be treated and rendered harmless.

There is probably no department of medicine which at the present time promises so much in the way of the prevention of disease as the study of so-called carriers, and there is no department in which the general practitioner can add so much to our knowledge and efficiency as in this one. Indeed, it may be considered the duty of every practitioner not only to diagnosticate and successfully treat developed cases of the disease, but by the aid of information such as is given in this volume to prevent the spread of disease to himself, his family, and to the people that depend upon him for health and happiness.

SURGICAL ASPECTS OF TYPHOID AND PARATYPHOID FEVERS. By A. E. Webb-Johnson, D.S.O. With Foreword by Lieut.-General T. H. Goodwin, C.B., C.M.G., D.S.O. London: Henry Frowde, Oxford University Press. Hodder & Stoughton, Warwick Square, E. C., 1919.

This brochure, the first study of its kind since the classical article in Keen's Surgery, is based on an extensive clinical experience. It begins with a historical sketch in which it is stated that we find the first evidence of the disease in 1643, being described then by Willis, better known from his studies of the anastomosis of the main cerebral arteries at the base of the brain. In Hunter's collection of specimens are shown the various stages of enlargement and ulceration of Peyer's patches and of the solitary follicles with the formation and separation of sloughs and the process of healing. Keen is given the credit of being the first surgeon to give this subject careful study.

There follows an introductory chapter

briefly alluding to the symptomatology, the serum diagnosis, and blood picture. Thereafter there is a general review of surgical complications, among these being mentioned esophageal ulcer with its resultant stricture, appendicitis, peritonitis from other causes than perforation, intestinal obstruction, subphrenic abscess; rupture of the spleen, liver abscess, gangrene, arterial and venous thrombosis, pyelitis and cystitis, epididymo-orchitis, parotitis, laryngitis, pulmonary, pleural and joint complications, particularly suppurative arthritis, bone complications, and eye and ear complications.

The carrier problem is considered in some detail, particularly those exhibiting lesions in one or other excretory channel. The urinary carrier usually has pyuria as well as bacilluria; the intestinal carrier mostly exhibits lesions in the gall-bladder either with or without gallstone. It is noted that even in spite of the removal of the part which has been the seat of the inflammatory condition the carrier state may persist. Bone-marrow is the tissue which has been known to harbor bacilli for a long period. It is a part of the body most constantly infected. Regarding the spleen, the author states that this organ is like a scavenger removing refuse and thus protecting the community from infective danger, but if not scrupulously careful in attending to its own cleanliness, becoming a source of danger by harboring infective material which ought to have been sent to the destructor. It is held that splenectomy may yet be undertaken for the cure of persistent typhoid or paratyphoid infection.

THE OPERATIVE TREATMENT OF CHRONIC INTESTINAL STASIS. By Sir Arbuthnot Lane, Bart., C.B. Fourth Edition, Revised and Enlarged. London: Henry Frowde, Oxford University Press. Hodder & Stoughton, Warwick Square, E. C., 1918.

Lane reviews and still further clarifies his always lucidly expressed views on the topic under discussion in this his fourth edition. By chronic intestinal stasis he means a condition of abnormal delay in the passage of the gastrointestinal content, which he holds has its starting-point in the rectum and pelvic colon. This causes a resultant distention of the pelvic colon and a stretching of the under layer of the mesentery. Resistance to this is expressed in the form of physical opacities, which in the course of contraction causes local constriction. Later there may be ulceration and a spastic condition of the pylorus from its constant efforts to prevent regurgitation of the contents of the duodenum into the stomach. The stomach dilates and hypertrophies because of the obstruction to the evacuation of its contents by the spastic condition of the pylorus.

Lane holds that no surgical operation is more wonderful and far reaching in its effects than colectomy in Still's disease and Raynaud's disease. In these conditions, within twenty-four hours of the operation, joints which have been fixed, swollen and painful for long periods become painless and mobile and diminish in size with extraordinary rapidity. In Raynaud's disease the nearly immediate return of the long-diseased hands to a normal state after freeing the ileal effluent is even more striking.

There is a chapter on Dynamics; upon the *x*-ray as applied to the investigation of chronic intestinal stasis; the Bacterio-Chemistry of the Small Intestine, by Mutch; X-Disease by Sir James Mackenzie, whose large philosophy and quick interest are manifest, taken from the third edition of this distinguished author's book upon Diseases of the Heart; an extremely interesting study upon Pressure Changes in the Skeleton as Indicating the Labor History of the Individual, the changes occurring in a coal trimmer and a shoemaker being carefully set forth; a contribution by Keith upon The Great Bowel, from an anatomist's point of view; one on Intestinal Stasis, Intoxication, and Subinfection, by Adami; a study by Robertson upon the Blood Picture in Intestinal Stasis; a section by Clarke upon Intestinal Toxemia and Loss of Accommodative Power; one by Williams upon The Medical Aspect of Intestinal Stasis; one by Mutch on Chronic Streptococcal Infection

of the Alimentary Tract; one by Chapple upon The Gynecological Aspect of Chronic Intestinal Stasis; one by Forsythe upon Pyorrhea and its Relation to Chronic Intestinal Stasis.

This book represents a series of contributions, each having a distinct bearing upon a pathological condition for the relief of which Lane proposes, in the persistent and obstinate cases which are progressive in spite of treatment, to wit, paraffin oil, with external support, removal of the colon.

THE EARLY TREATMENT OF WAR WOUNDS. By H. M. W. Gray, C.B., C.M.G., M.B. Aberdeen, F.R.C.S. Ed. London: Henry Frowde, Oxford University Press. Hodder & Stoughton, Warwick Square, E. C., 1919.

A kindly introduction by General Goodwin, a preface by the author briefly outlining his extensive experience, expressing appreciation of some of the most distinguished of his coworkers, is followed by a chapter upon the Surgical Treatment of Wounded Men at Advanced Units; Early Treatment of War Wounds at a Casualty Clearing Station; Treatment of Wound Shock; Considerations Regarding the Use of Different Kinds of Antiseptics and Dressings; the Treatment of Gunshot Wounds at Casualty Clearing Stations; the Operative Treatment of War Wounds; Wounds of the Brain and its Coverings; Penetrating Wounds of the Thorax; Injuries to the Spinal Cord; Compound Fracture of the Femur and Wounds of Joints, with a Postscript.

The author gives a good description of the active driving work at the front. Transfusion in the treatment of shock is accorded its proper place, and made more generally available by the knowledge that blood-corpuscles may be preserved by means of dextrose and have been stored on ice for as long as four weeks without losing their viability. It is noted that the pulse-rate and general condition of the patient are much better indices of the course of the wound than is temperature. The salt pack is not only commended, but spoken of with some enthusiasm.

The book throughout expresses the opinions of a keen observer and largely practiced surgeon and is a valuable addition to the surgical literature of war.

NOTES AND QUERIES.

A BONE-DRY PROBLEM.

The enforcement of prohibition will involve many novel problems. The use of alcohol as a solvent and menstruum for drugs is so general and its properties as a solvent are of such great value that it will be impossible to dispense with it without a complete reconstruction of our materia medica. An effort to do away entirely with the use of alcohol as a menstruum would be so far reaching that even if we had any satisfactory, non-intoxicating substitute, it would take years to bring about the change. But we have no satisfactory substitute for alcohol in that direction, and we are therefore called upon to decide whether we shall conserve the interests of the sick by continuing the use of alcohol as a solvent in medicinal preparations, or whether the sick shall be made to suffer by a discontinuance of the use of alcohol as a menstruum merely because a comparatively few people misuse the medicaments containing alcohol in order to gratify their craving for alcoholic stimulants.

The Bureau of Internal Revenue has hitherto held that the mere presence of alcohol in a liquid was not to be taken as conclusive evidence that the liquid was an intoxicating liquor. The question of whether it was or was not an intoxicating liquor would depend upon the amount of active in-

gredients present. This stand has been enforced in a sane and reasonable manner by the Bureau, which has published from time to time lists of preparations which purported to be medicinal in character, but which in the opinion of the Bureau contained an insufficient proportion of the medicinal ingredients to support this claim. These preparations have been listed as not being medicinal in the opinion of the authorities, and those who sold them have been required to take out licenses as liquor dealers. The rulings which have been made by the Bureau have been fair and the methods of promulgating the lists as a warning to dealers have proved satisfactory. It is to be hoped that this method will still be pursued, so that dealers will have a definite guide before them as to what is an intoxicating liquor and what a medicinal product.

In some cases the State authorities have followed the lead of the Federal authorities and have adopted the findings of the latter from time to time and made them a part of the State regulations. This is a wise procedure, as an attempt on the part of any State or local authority to set up its own list of preparations which may not be sold as medicines would result in a degree of confusion which would seriously embarrass legitimate business in medicinal products.—*New York Medical Journal,* April 19, 1919.

ON THE CONSTITUTIONALITY OF THE LAWS ON CONTROL OF HABIT-FORMING DRUGS AND FILING REPORTS OF CONTAGIOUS DISEASES.

Lewis, an attorney, in the *New York State Journal of Medicine* for March, 1919, reviews the situation as follows:

1. Originally there was no common-law right providing for the privilege of secrecy between physician and patient.

2. The first statute that referred to it in New York State was in 1828, and that gave such a right.

3. Since that time legal evolution has safeguarded, reëstablished, and by various statutory laws provided that sick-bed secrets shall be inviolate.

4. Under the protection of the various laws, built up as a bulwark, a right has been created, under which enactments the public has come to rely for protection against disclosures of a physician.

5. Legal decisions have repeatedly required that a doctor must use his enlightened judgment in the care of his patient, if honestly given. The proposed New York law, referring to the treatment of drug addicts, deprives him of that right.

6. The protection of silence, which has grown up under statute law, surely is violated by these statutory provisions.

7. The records provided for in both of these laws are inadequately safeguarded.

8. These records becoming part of the public health record of the State are easily revealed, making blackmail easy of application.

9. The "Harrison Law" (Federal) is quite adequate to completely protect the purchase, possession, prescription and administration of habit-forming drugs. None other is needful. Duplication of effort is misunderstood, oftentimes misleading.

Finally, Lewis is convinced, though the decisions are at variance, that the statutory provisions, beginning with the laws of 1828, have surrounded the public with certain rights of secrecy in reference to their physical condition, which rights are violated by both of the State laws above referred to.

He is, therefore, forced to the conclusion that rights of citizens, established by years of statutory enactment, referring to the privilege of secrecy of facts connected with the relationship of doctor and patient, are by these two laws violated so far as they refer to this privilege, and should be completely eliminated as a part of the law, because they contravene acquired statutory rights of citizens which the State Constitution safeguards.